```
=> file .nash

=> s (superoxide dismutase or catalase) and (phaffia or rhodozyma) and gene
L1            0 FILE MEDLINE
L2            1 FILE CAPLUS
L3            1 FILE SCISEARCH
L4            0 FILE LIFESCI
L5            0 FILE BIOSIS
L6            0 FILE EMBASE

TOTAL FOR ALL FILES
L7            2 (SUPEROXIDE DISMUTASE OR CATALASE) AND (PHAFFIA OR RHODOZYMA)
                AND GENE

=> d ibib abs 1-2

L7   ANSWER 1 OF 2  CAPLUS  COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER:         2001:472044  CAPLUS
DOCUMENT NUMBER:          135:72140
TITLE:                    Recombinant production of carotenoids, particularly
                          astaxanthin
INVENTOR(S):              Hoshino, Tatsuo; Ojima, Kazuyuki; Setoguchi, Yutaka
PATENT ASSIGNEE(S):       F. Hoffmann-La Roche A.-G., Switz.
SOURCE:                   Eur. Pat. Appl., 32 pp.
                          CODEN: EPXXDW
DOCUMENT TYPE:            Patent
LANGUAGE:                 English
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.        KIND  DATE          APPLICATION NO.  DATE
     ---------------   ----  --------      ---------------  --------
     EP 1111067         A2   20010627      EP 2000-126114   20001129
     EP 1111067         A3   20011010
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
             IE, SI, LT, LV, FI, RO
     NO 2000006050      A    20010605      NO 2000-6050     20001129
     JP 2001190294      A2   20010717      JP 2000-367099   20001201
     BR 2000005690      A    20010731      BR 2000-5690     20001201
     CN 1316520         A    20011010      CN 2000-137112   20001201
     US 2002168703      A1   20021114      US 2000-727855   20001201
PRIORITY APPLN. INFO.:                  EP 1999-123821   A  19991201
AB   The present invention is directed to a process for producing carotenoids
     comprising cultivating a recombinant organism having a gene for
     one or more active oxygen species-quenching factor(s) that is
     substantially disrupted with a disruption cassette specific to the
     gene, and recovering carotenoids from the culture, as well as to
     genetic materials useful in the said process, such as a recombinant
     organism producible of carotenoids, a disruption cassette, a recombinant
     DNA sequence, a recombinant DNA fragment; and a polynucleotide.  Thus,
     Phaffia rhodozyma ATCC 96595 genes sod1
     encoding mitochondrial superoxide dismutase, sod2
     encoding cytoplasmic superoxide dismutase, and cat
     encoding catalase were identified and cloned.  These cloned
     genes were then employed to construct disruption plasmids specific
     for each of these gene.  The resulting mutant P.
     rhodozyma strains demonstrated enhanced prodn. of carotenoids and
     astaxanthin when compared to original strain.

L7   ANSWER 2 OF 2  SCISEARCH  COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER:    1998:888499  SCISEARCH
THE GENUINE ARTICLE: 139BR
TITLE:               Induction and control of chromoplast-specific carotenoid
                     genes by oxidative stress
AUTHOR:              Bouvier F; Backhaus R A; Camara B (Reprint)
CORPORATE SOURCE:    CNRS, INST BIOL MOL PLANTES, 12 RUE GEN ZIMMER, F-67084
                     STRASBOURG, FRANCE (Reprint); CNRS, INST BIOL MOL PLANTES,
                     F-67084 STRASBOURG, FRANCE; UNIV STRASBOURG 1, F-67084
                     STRASBOURG, FRANCE; ARIZONA STATE UNIV, DEPT BOT, TEMPE,
                     AZ 85287
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COUNTRY OF AUTHOR: FRANCE; USA
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (13 NOV 1998) Vol. 273, No. 46, pp. 30651-30659.
Publisher: AMER SOC BIOCHEMISTRY MOLECULAR BIOLOGY INC, 9650 ROCKVILLE PIKE, BETHESDA, MD 20814.
ISSN: 0021-9258.
DOCUMENT TYPE: General Review; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 107

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The differentiation of chloroplasts into chromoplasts involves a series of biochemical changes that culminate with the intense accumulation of long chain chromophore carotenoïds such as lycopene, rhodoxanthin, astaxanthin, anhydroeschsoltzxanthin, capsanthin, and capsorubin. The signal pathways mediating these transformations are unknown. Chromoplast carotenoids are known to accumulate in green tissues experiencing stress conditions, and studies indicate that they provide efficient protection against oxidative stress. We tested the role of reactive oxygen species (ROS) as regulators of chromoplast carotenoid biosynthesis in vivo. The addition of ROS progenitors, such as menadione, tert-butylhydroperoxide, or paraquat and prooxidants such as diamide or buthionine sulfoximine to green pericarp discs of pepper fruits rapidly and dramatically induce the simultaneous expression of multiple carotenogenic **gene** mRNAS that give rise to capsanthin. Similarly, down-regulation of **catalase** by amitrole induces expression of carotenogenic **gene** mRNAs leading to the synthesis of capsanthin in excised green pericarp discs. ROS signals from plastids and mitochondria also contribute significantly to this process. Analysis of the capsanthin-capsorubin synthase promoter in combination with a P-glucuronidase reporter **gene** reveals strong activation in transformed pepper protoplasts challenged with the above ROS. Collectively these data demonstrate that ROS act as a novel class of second messengers that mediate intense carotenoid synthesis during chromoplast differentiation.

=> log y

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=> file .nash

=> s caroten? and superoxide dismutase
L1          299 FILE MEDLINE
L2          645 FILE CAPLUS
L3          411 FILE SCISEARCH
L4           53 FILE LIFESCI
L5          408 FILE BIOSIS
L6          438 FILE EMBASE

TOTAL FOR ALL FILES
L7         2254 CAROTEN? AND SUPEROXIDE DISMUTASE

=> s caroten? (A) superoxide dismutase
TOTAL FOR ALL FILES
L14          18 CAROTEN? (A) SUPEROXIDE DISMUTASE

=> s caroten? and (superoxide dismutase or catalase)

TOTAL FOR ALL FILES
L21        2817 CAROTEN? AND (SUPEROXIDE DISMUTASE OR CATALASE)

=> s l21 and gene
TOTAL FOR ALL FILES
L28         165 L21 AND GENE

=> s l28 not 2000-2004/py

TOTAL FOR ALL FILES
L35          87 L28 NOT 2000-2004/PY

=> dup rem l35
PROCESSING COMPLETED FOR L35
L36          49 DUP REM L35 (38 DUPLICATES REMOVED)

=> d 1-49 ibib abs

L36  ANSWER 1 OF 49  BIOSIS  COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
ACCESSION NUMBER:    1999:355750  BIOSIS
DOCUMENT NUMBER:     PREV199900355750
TITLE:               Singlet oxygen is part of a hyperoxidant state generated
                     during spore germination.
AUTHOR(S):           Lledias, Fernando; Rangel, Pablo; Hansberg, Wilhelm
                     [Reprint author]
CORPORATE SOURCE:    Departamento de Bioquimica, Instituto de Fisiologia
                     Celular, Universidad Nacional Autonoma de Mexico, 04510,
                     Mexico, DF, Mexico
SOURCE:              Free Radical Biology and Medicine, (June, 1999) Vol. 26,
                     No. 11-12, pp. 1396-1404. print.
                     CODEN: FRBMEH. ISSN: 0891-5849.
DOCUMENT TYPE:       Article
LANGUAGE:            English
ENTRY DATE:          Entered STN: 2 Sep 1999
                     Last Updated on STN: 2 Sep 1999
AB   We show that singlet oxygen is generated in asexual spores (conidia) from
     Neurospora crassa at the onset of germination.  Oxidation of N. crassa
     catalase-1 (Cat-1) was previously shown to be caused by singlet
     oxygen (Lledias et al.  J.  Biol.  Chem. 273, 1998).  In germinating
     conidia, increased protein oxidation, decrease of total protein, Cat-1
     oxidation and accumulation of cat-1 mRNA was detected.  These changes were
     modulated in vivo by light intensity, an external clean source of singlet
     oxygen, and by carotene amount and content of coordinated double
     bonds.  Conditions that stimulated singlet oxygen formation increased
     Cat-1 oxidation and accumulation of cat-1 mRNA.  Germinating conidia from
     mutant strains altered in carotene synthesis showed increased
     levels of protein degradation, Cat-1 oxidation and accumulation of cat-1
     mRNA.  During germination Cat-1a was oxidized, oxidized Cat-1c-Cat-1e
     conformers disappeared and Cat-1a was synthesized de novo.  Furthermore,
     spontaneous oxygen-dependent chemiluminescence increased as soon as
     conidia absorbed dissolved oxygen.  Low-level chemiluminescence is due to
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photon emission from excited electrons in carbonyls and singlet oxygen as they return to their ground state. H2O2 added to conidia under Ar caused a peak of chemiluminescence and germination of 20% of conidia, suggesting that a hyperoxidant state suffices to start germination under anaerobic conditions. Taken together, these results show that singlet oxygen is part of a hyperoxidant state that develops at the start of germination of conidia, in consonance with our proposal that morphogenetic transitions occur as a response to a hyperoxidant state.

L36 ANSWER 2 OF 49 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 1999358006 EMBASE
TITLE: Intracellular antioxidants: From chemical to biochemical mechanisms.
AUTHOR: Chaudiere J.; Ferrari-Iliou R.
CORPORATE SOURCE: J. Chaudiere, UFR de Biologie, Universite Paris 7, 2 place Jussieu, 75251 Paris Cedex 05, France
SOURCE: Food and Chemical Toxicology, (1999) 37/9-10 (949-962). Refs: 151
ISSN: 0278-6915 CODEN: FCTOD7
PUBLISHER IDENT.: S 0278-6915(99)00090-3
COUNTRY: United Kingdom
DOCUMENT TYPE: Journal; General Review
FILE SEGMENT: 029 Clinical Biochemistry
037 Drug Literature Index
LANGUAGE: English
SUMMARY LANGUAGE: English

AB Intracellular antioxidants include low molecular weight scavengers of oxidizing species, and enzymes which degrade superoxide and hydroperoxides. Such antioxidants systems prevent the uncontrolled formation of free radicals and activated oxygen species, or inhibit their reactions with biological structures. Hydrophilic scavengers are found in cytosolic, mitochondrial and nuclear compartments. Ascorbate and glutathione scavenge oxidizing free radicals in water by means of one-electron or hydrogen atom transfer. Similarly, ergothioneine scavenges hydroxyl radicals at very high rates, but it acts more specifically as a chemical scavenger of hypervalent ferryl complexes, halogenated oxidants and peroxynitrite-derived nitrating species, and as a physical quencher of singlet oxygen. Hydrophobic scavengers are found in cell membranes where they inhibit or interrupt chain reactions of lipid peroxidation. In animal cells, they include .alpha.-tocopherol (vitamin E) which is a primary scavenger of lipid peroxyl radicals, and **carotenoids** which are secondary scavengers of free radicals as well as physical quenchers of singlet oxygen. The main antioxidant enzymes include dismutases such as **superoxide dismutases** (SOD) and **catalases**, which do not consume cofactors, and peroxidases such as selenium-dependent glutathione peroxidases (GPx) in animals or ascorbate peroxidases (APx) in plants. The reducing coenzymes of peroxidases, and as a rule all reducing components of the antioxidant network, are regenerated at the expense of NAD(P)H produced in specific metabolic pathways. Synergistic and co-operative interactions of antioxidants rely on the sequential degradation of peroxides and free radicals as well as on mutual protections of enzymes. This antioxidant network can induce metabolic deviations and plays an important role in the regulation of protein expression and/or activity at the transcriptional or post-translational levels. Its biological significance is discussed in terms of environmental adaptations and functional regulations of aerobic cells. Copyright (C) 1999 Elsevier Science Ltd.

L36 ANSWER 3 OF 49 MEDLINE on STN

ACCESSION NUMBER: 1999247817 MEDLINE
DOCUMENT NUMBER: PubMed ID: 10232832
TITLE: Modification of **gene** expression by dietary antioxidants in radiation-induced apoptosis of mice splenocytes.
AUTHOR: Ushakova T; Melkonyan H; Nikonova L; Afanasyev V; Gaziev A I; Mudrik N; Bradbury R; Gogvadze V
CORPORATE SOURCE: Institute of Theoretical and Experimental Biophysics, Pushchino, Russia.
SOURCE: Free radical biology & medicine, (1999 Apr) 26 (7-8) 887-91.

Journal code: 8709159. ISSN: 0891-5849.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199906
ENTRY DATE: Entered STN: 19990712
Last Updated on STN: 19990712
Entered Medline: 19990623

AB The modification of radiation-induced apoptosis in splenocytes by a vitamin-containing dietary supplement was studied. For 45 days prior to irradiation at a lethal dose of 6 Gy, mice received a dietary supplement containing vitamins with antioxidant properties and microelements. The expression of TRPM-2 (a marker for programmed cell death), bcl-2 (the product of which has been shown to prevent apoptosis), **superoxide dismutase**, and **catalase genes** was studied at different time intervals after irradiation. Radiation-induced alterations in **gene** expression were different in the control and the antioxidant mixture-fed mice. The antioxidant mixture administration resulted in an inhibition of TRPM-2 expression both before and after irradiation. The bcl-2 mRNA content steadily increased after irradiation in splenocytes from antioxidant mixture-fed mice, while in the control group 2-h after irradiation only trace amount of bcl-2 mRNA was detected. In splenocytes from control mice, the expression of **superoxide dismutase** and **catalase genes** significantly decreased within 2-h after irradiation; whereas in mice receiving the antioxidant mixture, inhibition of **catalase gene** expression was not as prominent. The expression of **superoxide dismutase gene** was still high 24-h after irradiation. The antioxidant administration decreased the radiation-induced apoptosis and delayed internucleosomal fragmentation of DNA. Our data suggest that radiation-induced alteration of **gene** expression is, at least in part, determined by reactive oxygen species.

L36 ANSWER 4 OF 49 MEDLINE on STN
ACCESSION NUMBER: 1999332289 MEDLINE
DOCUMENT NUMBER: PubMed ID: 10402529
TITLE: Reactive oxygen metabolites, antioxidants and head and neck cancer.
AUTHOR: Seidman M D; Quirk W S; Shirwany N A
CORPORATE SOURCE: Department of Otolaryngology-Head and Neck Surgery, Henry Ford Hospital, 6777 W. Maple Road, W. Bloomfield, MI 48323, USA.
SOURCE: Head & neck, (1999 Aug) 21 (5) 467-79. Ref: 479
Journal code: 8902541. ISSN: 1043-3074.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199908
ENTRY DATE: Entered STN: 19990910
Last Updated on STN: 19990910
Entered Medline: 19990825

AB This manuscript will review the probable role of reactive oxygen metabolites (ROM) in the etiopathogenesis of head and neck cancer (HNC). Cancer is a heterogeneous disorder with multiple etiologies including somatic and germ-line mutations, cellular homeostatic disturbances, and environmental triggers. Certain etiologies are characteristic of HNC and include infectious agents such as the Epstein-Barr virus, the use of tobacco, and consumption of alcohol. A large body of evidence implicates ROM in tumor formation and promotion. ROM species are formed in the process of cellular respiration, specifically during oxidative phosphorylation. These ubiquitous molecules are highly toxic in the cellular environment. Of the many effects of ROM, especially important are their effect on DNA. Specifically, ROM cause a variety of DNA damage, including insertions, point mutations, and deletions. Thus, it is hypothesized that ROM may be critically involved in the etiology of malignant disease through their possible impact on protooncogenes and tumor suppressor **genes**. Additionally, empirical evidence

suggests that ROM may also affect the balance between apoptosis and cellular proliferation. If apoptotic mechanisms are overwhelmed, uncontrolled cellular proliferation may follow, potentially leading to tumor formation. Thus, this manuscript will critically review the evidence that supports the role of ROM in tumorigenesis. ROM scavengers and blockers have shown both in vivo and in vitro effects of attenuating the toxicity of ROM. Such compounds include the antioxidant vitamins (A, C, and E), nutrient trace elements (selenium), enzymes (**superoxide dismutase**, glutathione peroxidase, and **catalase**), hormones (melatonin), and a host of natural and synthetic compounds (lazaroids, allopurinol, gingko extract). Thus, this paper will also review the possible benefit derived from the use of such scavengers/blockers in the prevention of HNC.
 Head Neck 21: 467-479, 1999.

L36 ANSWER 5 OF 49 SCISEARCH
ACCESSION NUMBER: 2000:323566 SCISEARCH
THE GENUINE ARTICLE: 306WM
TITLE: Effect of antioxidant supplementation on the adaptive response of human skin fibroblasts to UV-induced oxidative stress
AUTHOR: Jones S A; McArdle F; Jack C I A; Jackson M J (Reprint)
CORPORATE SOURCE: UNIV LIVERPOOL, DEPT MED, LIVERPOOL L69 3GA, MERSEYSIDE, ENGLAND (Reprint); UNIV LIVERPOOL, DEPT MED, LIVERPOOL L69 3GA, MERSEYSIDE, ENGLAND
COUNTRY OF AUTHOR: ENGLAND
SOURCE: REDOX REPORT, (MAY 1999) Vol. 4, No. 6, pp. 291-299. Publisher: MANEY PUBLISHING LTD, HUNDSON RD, LEEDS LS9 7DL, ENGLAND.
ISSN: 1351-0002.
DOCUMENT TYPE: Article; Journal
LANGUAGE: English
REFERENCE COUNT: 37
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The effect of supplementation with substances having antioxidant properties on the adaptive responses of human skin fibroblasts to UV-induced oxidative stress was studied in vitro. UVR was found to induce a substantial oxidative stress in fibroblasts, resulting in an increased release of superoxide anions and an increase in lipid peroxidation (shown by an elevated malonaldehyde content). Sub-lethal doses of UVR were also found to induce adaptive responses in the fibroblast antioxidant defences, with a transient rise in **catalase** and **superoxide dismutase** activities followed by a slower, large increase in cellular glutathione content. Supplementation of the fibroblasts with the antioxidants, Trolox (a water soluble analogue of alpha-tocopherol), ascorbic acid or beta-**carotene**, had differential effects on these responses. Trolox supplementation reduced the UVR-induced cellular oxidative stress and adaptive response in a predictable concentration-dependant manner. This was in contrast to ascorbic acid which increased superoxide release from fibroblasts. At low doses, ascorbate supplements also reduced the magnitude of the adaptive increases in **catalase** and **superoxide dismutase** activities and increase in glutathione content, beta-**Carotene** had a similar effect to ascorbic acid, reducing the extent of the adaptations to UVR at lower doses while simultaneously increasing superoxide release and malonaldehyde content. These in vitro data indicate that only the vitamin E analogue suppressed UVR-induced oxidative stress in a predictable manner and suggest that common dietary antioxidants may not be equally effective in reducing the potential deleterious effects of UVR-induced oxidative stress in skin.

L36 ANSWER 6 OF 49 LIFESCI
ACCESSION NUMBER: 2000:10529 LIFESCI
TITLE: Iron **Superoxide Dismutase** Protects against Chilling Damage in the Cyanobacterium Synechococcus species PCC7942
AUTHOR: Thomas, D.J.; Thomas, J.B.; Prier, S.D.; Nasso, N.E.; Herbert, S.K.
CORPORATE SOURCE: University of Idaho, Department of Biological Sciences, Moscow, Idaho 83844-3051 USA; E-mail: skherbe@uidaho.edu
SOURCE: Plant Physiology [Plant Physiol.], (19990500) vol. 120, no.

1, pp. 275-282.
ISSN: 0032-0889.
DOCUMENT TYPE: Journal
FILE SEGMENT: Q4
LANGUAGE: English
SUMMARY LANGUAGE: English
AB A strain of Synechococcus sp. PCC7942 lacking functional Fe **superoxide dismutase** (SOD), designated sodB super(-), was characterized by its growth rate, photosynthetic pigments, inhibition of photosynthetic electron transport activity, and total SOD activity at 0 degree C, 10 degree C, 17 degree C, and 27 degree C in moderate light. At 27 degree C, the sodB super(-) and wild-type strains had similar growth rates, chlorophyll and **carotenoid** contents, and cyclic photosynthetic electron transport activity. The sodB super(-) strain was more sensitive to chilling stress at 17 degree C than the wild type, indicating a role for FeSOD in protection against photooxidative damage during moderate chilling in light. However, both the wild-type and sodB super(-) strains exhibited similar chilling damage at 0 degree C and 10 degree C, indicating that the FeSOD does not provide protection against severe chilling stress in light. Total SOD activity was lower in the sodB super(-) strain than in the wild type at 17 degree C and 27 degree C. Total SOD activity decreased with decreasing temperature in both strains but more so in the wild type. Total SOD activity was equal in the two strains when assayed at 0 degree C.

L36 ANSWER 7 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 1999:681269 SCISEARCH
THE GENUINE ARTICLE: 231HD
TITLE: Effect of nitrogen limitation on foliar antioxidants in relationship to other metabolic characteristics
AUTHOR: Logan B A; DemmigAdams B (Reprint); Rosenstiel T H; Adams W W
CORPORATE SOURCE: UNIV COLORADO, DEPT ENVIRONM POPULAT & ORGANISM BIOL, BOULDER, CO 80309 (Reprint); UNIV COLORADO, DEPT ENVIRONM POPULAT & ORGANISM BIOL, BOULDER, CO 80309; BOWDOIN COLL, DEPT BIOL, BRUNSWICK, ME 04011
COUNTRY OF AUTHOR: USA
SOURCE: PLANTA, (AUG 1999) Vol. 209, No. 2, pp. 213-220.
Publisher: SPRINGER VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010.
ISSN: 0032-0935.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 41
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
AB The long-term effect of limiting soil nitrogen (N) availability on foliar antioxidants, thermal energy dissipation, photosynthetic and respiratory electron transport, and carbohydrates was investigated in Spinacia oleracea L. Starch, sucrose, and glucose accumulated in leaves of N-limited spinach at predawn, consistent with a downregulation of chloroplast processes by whole-plant sink limitation in response to a limited supply of N-based macromolecules throughout the plant. On a leaf-area or dry-weight basis, levels of chlorophyll, **carotenoid** pools, photosynthetic electron transport capacity, as well as activities for the predominantly chloroplast-localized antioxidant enzymes ascorbate peroxidase (EC 1.11.1.11) and glutathione reductase (EC 1.6.4.2) were much lower in N-limited versus N-replete plants. When expressed on a chlorophyll basis, foliar levels of all of these parameters were similar in N-replete versus N-limited plants. However, on a total-protein basis, antioxidant enzyme activities were higher in N-limited plants. Nitrogen-limited spinach showed higher levels of thermal energy dissipation and of zeaxanthin and antheraxanthin at midday, as well as slightly higher ascorbate contents relative to chlorophyll. These results indicate that strong, longterm N limitation led not only to alterations in the balance between different processes but also to an overall downregulation of light collection, photosynthetic electron transport capacity, and chloroplast-based antioxidant enzymes. This is further supported by the finding that glucose-feeding of excised leaves led to strong concomitant decreases in photosynthetic electron transport capacity and ascorbate peroxidase activity. On a leaf-area basis, neither

superoxide dismutase (EC 1.15.1.1) activity nor dark repiration rates showed a treatment effect. This indicates that overall mitochondrial electron transport activity does not decrease under long-term N limitation and is consistent with localization of an important fraction of foliar **superoxide dismutase** in mitochondria.

L36 ANSWER 8 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 1999:251148 SCISEARCH
THE GENUINE ARTICLE: 179UC
TITLE: N-acetylcysteine-dependent protection against UV-B damage in two photosynthetic organisms
AUTHOR: Malanga G; Kozak R G; Puntarulo S (Reprint)
CORPORATE SOURCE: UNIV BUENOS AIRES, SCH PHARM & BIOCHEM, JUNIN 956, RA-1113 BUENOS AIRES, DF, ARGENTINA (Reprint); UNIV BUENOS AIRES, SCH PHARM & BIOCHEM, RA-1113 BUENOS AIRES, DF, ARGENTINA
COUNTRY OF AUTHOR: ARGENTINA
SOURCE: PLANT SCIENCE, (22 FEB 1999) Vol. 141, No. 2, pp. 129-137. Publisher: ELSEVIER SCI IRELAND LTD, CUSTOMER RELATIONS MANAGER, BAY 15, SHANNON INDUSTRIAL ESTATE CO, CLARE, IRELAND.
ISSN: 0168-9452.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 48

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Cellular thiols, specially glulathione, appear to play a key role in protection against oxidative damage arising from a number of stress conditions. Thus, the role of N-acetylcysteine (NAC) as a protector against oxidative damage associated with ultraviolet B (UV-B) in two photosynthetic organisms was evaluated. Algal cultures (Chlorella vulgaris) and soybean leaves (Glycine max var. Hood) were supplemented with 1 mM NAC before irradiation. The content of total thiols was significantly increased after treatment. After exposure to W-B, the ascorbyl radical-dependent electron paramagnetic resonance (EPR) signal was enhanced by 76 and 46% and lipid radical-dependent EPR signal increased by 83 and 188% in algal cultures and soybean leaves, respectively. Treatment with 1 mM NAC kept ascorbyl and lipid radical content in algae and soybean leave exposed to UV-B at the basal level. Supplementation with 1 mM NAC did not affect the content of lipid-soluble antioxidants (alpha-tocopherol, beta-**carotene**) in C. vulgaris or in soybean leaves. UV-B irradiation increased **catalase** activity in the algae by 145% and in soybean leaves by 34%, while total **superoxide dismutase** (SOD) activity was not affected. In both photosynthetic organisms the increase in **catalase** activity after UV-B exposure did not occur in the presence of 1 mM NAC. The results suggest that thiols play an important role in triggering cellular control against UV-B-related damage, as NAC pretreatment significantly decreased UV-B-dependent radical generation after irradiation. (C) 1999 Elsevier Science Ireland Ltd. All rights reserved.

L36 ANSWER 9 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 1999:517790 SCISEARCH
THE GENUINE ARTICLE: 210WG
TITLE: Effect of trilinolein on the activity and **gene** expression of **superoxide dismutase** in cultured rat brain astrocytes
AUTHOR: Chiu W T; Chan P; Liao S S; Liou J R; Cheng J T (Reprint)
CORPORATE SOURCE: NATL CHENG KUNG UNIV, COLL MED, DEPT PHARMACOL, TAINAN 70101, TAIWAN (Reprint); NATL CHENG KUNG UNIV, COLL MED, DEPT PHARMACOL, TAINAN 70101, TAIWAN; TAIPEI WAN FANG HOSP, DIV NEUROSURG, TAIPEI, TAIWAN; TAIPEI WAN FANG HOSP, CLIN RES CTR, TAIPEI, TAIWAN
COUNTRY OF AUTHOR: TAIWAN
SOURCE: NEUROSCIENCE LETTERS, (2 JUL 1999) Vol. 269, No. 1, pp. 17-20. Publisher: ELSEVIER SCI IRELAND LTD, CUSTOMER RELATIONS MANAGER, BAY 15, SHANNON INDUSTRIAL ESTATE CO, CLARE, IRELAND.
ISSN: 0304-3940.

DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 21
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Cerbrovascular disease is one of the major causes of morbidity and mortality in recent. Oxygen free radicals produced during cerebral infarction increases the damage to neurons. **Superoxide dismutase** (SOD) is the endogenous antioxidant enzyme that can effectively scavenge superoxide radicals. Trilinolein is a lipophilic antioxidant purified from the herb of Panax pseudoginseng. In the cultured rat brain astrocytes (RBA), the activity of SOD (both Cu,Zn-SOD and Mn-SOD subtypes) was markedly increased by incubation with trilinolein at low concentration (0.1 mu M) for 2 days. This stimulatory effect of trilinolein was not related to the incubating concentration. However, long-term (7 days) incubation with trilinolein at same concentration decreased the activity. Similar changes were also observed in the **gene** expression of SOD in RBA; short-term (2 days) incubation of RBA by 0.1 mu M trilinolein increased the mRNA level that was lowered in RBA received a long-term incubation with 0.1 mu M trilinolein. This result shows that trilinolein is an effective antioxidant to increase the activity of SOD in RBA which would be beneficial to neurons subjected to oxygen free radical damage. However, long-term medication of antioxidant shall be concerned. (C) 1999 Elsevier Science Ireland Ltd. All rights reserved.

L36 ANSWER 10 OF 49 MEDLINE on STN DUPLICATE 1
ACCESSION NUMBER: 1999023999 MEDLINE
DOCUMENT NUMBER: PubMed ID: 9804838
TITLE: Induction and control of chromoplast-specific **carotenoid genes** by oxidative stress.
AUTHOR: Bouvier F; Backhaus R A; Camara B
CORPORATE SOURCE: Institut de Biologie Moleculaire des Plantes, CNRS and Universite Louis Pasteur, 67084 Strasbourg, France.
SOURCE: Journal of biological chemistry, (1998 Nov 13) 273 (46) 30651-9.
Journal code: 2985121R. ISSN: 0021-9258.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
OTHER SOURCE: GENBANK-Y14165
ENTRY MONTH: 199812
ENTRY DATE: Entered STN: 19990115
Last Updated on STN: 19990115
Entered Medline: 19981208

AB The differentiation of chloroplasts into chromoplasts involves a series of biochemical changes that culminate with the intense accumulation of long chain chromophore **carotenoids** such as lycopene, rhodoxanthin, astaxanthin, anhydroeschsoltzxanthin, capsanthin, and capsorubin. The signal pathways mediating these transformations are unknown. Chromoplast **carotenoids** are known to accumulate in green tissues experiencing stress conditions, and studies indicate that they provide efficient protection against oxidative stress. We tested the role of reactive oxygen species (ROS) as regulators of chromoplast **carotenoid** biosynthesis in vivo. The addition of ROS progenitors, such as menadione, tert-butylhydroperoxide, or paraquat and prooxidants such as diamide or buthionine sulfoximine to green pericarp discs of pepper fruits rapidly and dramatically induce the simultaneous expression of multiple **carotenogenic gene** mRNAS that give rise to capsanthin. Similarly, down-regulation of **catalase** by amitrole induces expression of **carotenogenic gene** mRNAs leading to the synthesis of capsanthin in excised green pericarp discs. ROS signals from plastids and mitochondria also contribute significantly to this process. Analysis of the capsanthin-capsorubin synthase promoter in combination with a beta-glucuronidase reporter **gene** reveals strong activation in transformed pepper protoplasts challenged with the above ROS. Collectively these data demonstrate that ROS act as a novel class of second messengers that mediate intense **carotenoid** synthesis during chromoplast differentiation.

L36 ANSWER 11 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 2
ACCESSION NUMBER: 1998:316037 SCISEARCH
THE GENUINE ARTICLE: ZH801
TITLE: A cyanobacterium lacking iron **superoxide dismutase** is sensitized to oxidative stress induced with methyl viologen but is not sensitized to oxidative stress induced with norflurazon
AUTHOR: Thomas D J; Avenson T J; Thomas J B; Herbert S K (Reprint)
CORPORATE SOURCE: UNIV IDAHO, DEPT BIOL SCI, MOSCOW, ID 83844 (Reprint); UNIV IDAHO, DEPT BIOL SCI, MOSCOW, ID 83844
COUNTRY OF AUTHOR: USA
SOURCE: PLANT PHYSIOLOGY, (APR 1998) Vol. 116, No. 4, pp. 1593-1602.
Publisher: AMER SOC PLANT PHYSIOLOGISTS, 15501 MONONA DRIVE, ROCKVILLE, MD 20855.
ISSN: 0032-0889.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: English
REFERENCE COUNT: 49

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB A strain of Synechococcus sp. strain PCC 7942 with no functional Fe **superoxide dismutase** (SOD), designated sodB(-), was characterized by its growth rate, photosynthetic pigments, and cyclic photosynthetic electron transport activity when treated with methyl viologen or norflurazon (NF). In their unstressed conditions, both the sodB(-) and wild-type strains had similar chlorophyll and **carotenoid** contents and **catalase** activity, but the wild type had a faster growth rate and higher cyclic electron transport activity. The sodB(-) was very sensitive to methyl viologen, indicating a specific role for the FeSOD in protection against superoxide generated in the cytosol. In contrast, the sodB(-) mutant was less sensitive than the wild type to oxidative stress imposed with NF. This suggests that the FeSOD does not protect the cell from excited singlet-state oxygen generated within the thylakoid membrane. Another up-regulated antioxidant, possibly the MnSOD, may confer protection against NF in the sodB(-) strain. These results support the hypothesis that different SODs have specific protective functions within the cell.

L36 ANSWER 12 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 3
ACCESSION NUMBER: 1998:944936 SCISEARCH
THE GENUINE ARTICLE: 144XR
TITLE: The role of reactive oxygen species in atherosclerosis
AUTHOR: Mugge A (Reprint)
CORPORATE SOURCE: RUHR UNIV BOCHUM, ST JOSEF HOSP, DIV CARDIOL, GUDRUNSTR 56, D-44791 BOCHUM, GERMANY (Reprint)
COUNTRY OF AUTHOR: GERMANY
SOURCE: ZEITSCHRIFT FUR KARDIOLOGIE, (NOV 1998) Vol. 87, No. 11, pp. 851-864.
Publisher: DR DIETRICH STEINKOPFF VERLAG, PLATZ DER DEUTSCHEN EINHEIT 25, D-64293 DARMSTADT, GERMANY.
ISSN: 0300-5860.
DOCUMENT TYPE: General Review; Journal
FILE SEGMENT: LIFE; CLIN
LANGUAGE: German
REFERENCE COUNT: 82

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Reactive oxygen species (ROS) are probably not only unintended, toxic side-products of oxygen metabolism in mammalian cells, they also have several important physiologic functions including antimicrobial killing, regulation of cellular proliferation and growth, and regulation of vascular tone. ROS are generated within the vessel wall by several mechanisms, including a vascular type of a NAD(P)H oxidase. ROS formation can be stimulated by mechanical stress, environmental factors, the peptide angiotensin II, cytokines, native low-density lipoproteins (LDL), and in the presence of catalytic metal ions. Their ability to modify LDL, react with endothelial-derived nitric oxide subsequently forming peroxynitrite, and amplify the expression of various **genes** important for leukocyte recruitment within the arterial wall are the basis of the oxidant injury theory of atherosclerosis. In animal studies, antioxidant therapy (probucol, butylated hydroxytoluene, N', N'-diphenylenediamide,

vitamin E, **superoxide dismutase**) have been successfully used to prevent fatty streak formation, and to restore impaired nitric oxide-dependent vasorelaxation. In man, antioxidant therapy (e. g., supplementation with vitamin E) clearly increased the resistance of LDL to oxidative modification. Case-controlled and prospective clinical studies suggest a relation between baseline antioxidant plasma levels and/or antioxidant supplementation and risk of cardiovascular events. In one secondary prevention trial (randomized,blinded,placebo-controlled), vitamin E supplementation reduced significantly the risk for non-fatal myocardial infarctions. Before general recommendations can be made, results of further large-scale trials should be awaited.

L36 ANSWER 13 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 4
ACCESSION NUMBER: 1999:17611 SCISEARCH
THE GENUINE ARTICLE: 148YM
TITLE: Bacterial **gene** products in response to near-ultraviolet radiation
AUTHOR: Eisenstark A (Reprint)
CORPORATE SOURCE: CTR CANC RES, 3501 BERRYWOOD DR, COLUMBIA, MO 65201 (Reprint)
COUNTRY OF AUTHOR: USA
SOURCE: MUTATION RESEARCH-FUNDAMENTAL AND MOLECULAR MECHANISMS OF MUTAGENESIS, (9 NOV 1998) Vol. 422, No. 1, pp. 85-95. Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS. ISSN: 0027-5107.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 102
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Our research has focused on bacterial **gene** products that protect cells from damage by near-ultraviolet radiation (near-UV) including **gene** products involved in the subsequent recovery process. Protective **gene** products include such anti-oxidants as **catalases, superoxide dismutases** and glutathione reductase. Near-UV damage recovery products include exonuclease LU and DNA-glycosylases. Perhaps more critical than the products of structural **genes** are certain regulatory **gene** products that are triggered upon excess near-UV oxidation and lead to synthesis of entire batteries of anti-oxidant enzymes, DNA repair enzymes, and DNA-integrity proteins. Our recent experiments have focused on RpoS and its interaction with OxyR, two proteins that regulate the synthesis of molecules that protect cells from near-UV and other oxidative stresses.

L36 ANSWER 14 OF 49 MEDLINE on STN DUPLICATE 5
ACCESSION NUMBER: 1998394065 MEDLINE
DOCUMENT NUMBER: PubMed ID: 9726002
TITLE: Effect of endogenous **carotenoids** and defective RpoS sigma factor on spontaneous mutation under starvation conditions in Escherichia coli: evidence for the possible involvement of singlet oxygen.
AUTHOR: Bridges B A; Timms A
CORPORATE SOURCE: MRC Cell Mutation Unit, University of Sussex, Falmer, Brighton, UK.. b.a.bridges@sussex.ac.uk
SOURCE: Mutation research, (1998 Jul 17) 403 (1-2) 21-8. Journal code: 0400763. ISSN: 0027-5107.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199809
ENTRY DATE: Entered STN: 19980925
Last Updated on STN: 19980925
Entered Medline: 19980914

AB Under starvation conditions, a variety of stationary phase **genes** are up-regulated under the control of the stationary phase sigma factor RpoS including at least two peroxidases and a protective DNA binding protein Dps. Previous work suggested that the reversion to prototrophy of

certain amino acid auxotrophs of Escherichia coli that occurs when the bacteria are starved of a required amino acid results from the accumulation of oxidative damage to guanine residues in DNA. We report here that three strains lacking RpoS are indistinguishable from wild type in their ability to undergo this starvation-associated mutation, suggesting that basal levels of **catalase** activity are more than adequate in these strains, and that the induction of **catalases** and other proteins controlled by rpoS does not contribute to the protection of the DNA, at least in cells starved in early stationary phase. In comparison, the introduction of a plasmid specifying the production of singlet oxygen scavengers (**carotenoids**) in stationary phase cells led to a roughly twofold reduction in mutant yield. The results suggest that singlet oxygen may be an important endogenously produced mutagen in resting cells.

L36 ANSWER 15 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 1998:80524 SCISEARCH
THE GENUINE ARTICLE: YR351
TITLE: Cromoglycate and nedocromil enhanced the reactive oxygen species-dependent suppressions with, but not without, dexamethasone in ischaemic and histamine paw oedema of mice
AUTHOR: Oyanagui Y (Reprint)
CORPORATE SOURCE: FUJISAWA PHARMACEUT CO LTD, DRUG DEV LABS 1, YODOGAWA KU, 2-1-6 KASHIMA, OSAKA 532, JAPAN (Reprint)
COUNTRY OF AUTHOR: JAPAN
SOURCE: MEDIATORS OF INFLAMMATION, (DEC 1997) Vol. 6, No. 5-6, pp. 369-374.
Publisher: RAPID SCIENCE PUBLISHERS, 2-6 BOUNDARY ROW, LONDON, ENGLAND SE1 8NH.
ISSN: 0962-9351.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE
LANGUAGE: English
REFERENCE COUNT: 17
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Anti-inflammatory actions of two anti-allergic drugs, alone or with dexamethasone (Dex) were examined in two models, because inflammation is claimed to be important for allergic events, especially for asthma, Cromoglycate and nedocromil were tested in ischaemic-and histamine-induced paw oedema models of mice. These antiallergic drugs (1-100 mg/kg, i.p.,) failed to suppress these oedemata, but enhanced the suppressions by a low dose of dexamethasone (0.1 mg/kg, s.,c.,) at 3-8 h after Dex injection, The mode of effects by anti-allergic drugs resembled that of a natural antioxidant (alpha-tocopherol, beta-**carotene** etc.), and was different from that of an immunosuppressant Like FK506. The enhancing potencies of the two anti-allergic drugs were similar at Gh after Dex in both oedemata, and mere diminished by **superoxide dismutase** (SOD) or **catalase** (i.p.). Cycloheximide completely abolished suppressions, Nedocromil, but not cromoglycate, inhibits inflammatory events, Therefore, there are common unknown actions by which the two anti-allergies enhance suppression by Dex, A possible mechanism of this action was supposed to enhance the superoxide and/or hydrogen peroxide-dependent glucocorticoid receptor (GR) signalling in the target cells.

L36 ANSWER 16 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1998:374861 CAPLUS
DOCUMENT NUMBER: 129:159853
TITLE: Human immunodeficiency virus-1 TAT protein and oxidant/antioxidant balance
AUTHOR(S): Flores, Sonia C.
CORPORATE SOURCE: Department of Physiology/Biophysics, Louisiana State University Medical Center, Shreveport, LA, 71130, USA
SOURCE: Oxygen Radicals and the Disease Process (1997), 157-174. Editor(s): Thomas, Craig E.; Kalyanaraman, Balaraman. Harwood: Amsterdam, Neth.
CODEN: 66FGAP
DOCUMENT TYPE: Conference; General Review
LANGUAGE: English

AB A review with approx. 50 refs. A virus will infect a cell provided that

all the necessary components for virion replication or **gene** expression are readily accessible. If the cell is non-replicating, the virus may transform it by forcing the inappropriate expression of proteins that stimulate mitosis, by removing some of these proteins from their appropriate controls, or by inducing a pro-oxidant state. Some viruses will, upon infection, manuf. specific protein factors that will either transform the host or activate its transcription. For example, the HIV genome codes for regulatory proteins that will affect cell physiol. either by direct or indirect mechanisms. Homeostasis is then affected by the take-over of cellular metabolic intermediates and the competition for substrates. Oxygen is necessary for aerobic life. Nevertheless, living in an oxygen-rich environment poses a significant amt. of problems: how to cope with the byproducts of oxygen redn. that are generated in the mitochondrion through electron transport or via other normal metabolic processes. In mammalian cells, there are enzymic and non-enzymic detoxifying systems which include **catalase**, the glutathione peroxidases, glucose-6-phosphate dehydrogenase, the **superoxide dismutases**, glutathione (GSH), ascorbic acid (vitamin C), vitamin E, and .beta.-**carotene**. Ironically, a low level of these toxic byproducts appears necessary for normal cell function, and the cell maintains the redox status within a very narrow range. Because changes in redox status have been implicated in the pathogenesis of so many diseases, including those of viral origin, increases in pro-oxidants or decreases in anti-oxidants would alter this balance with similar cellular outcomes.

REFERENCE COUNT: 116 THERE ARE 116 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L36 ANSWER 17 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 6

ACCESSION NUMBER: 1997:82181 CAPLUS
DOCUMENT NUMBER: 126:183853
TITLE: **Gene** expression in leaves of Arabidopsis thaliana induced to senesce by nutrient deprivation
AUTHOR(S): Thomas, Howard; de Villiers, Louise
CORPORATE SOURCE: Cell Biology Dep., Inst. Grassland Environmental Research, Aberystwyth, Dyfed, SY23 3 EB, UK
SOURCE: Journal of Experimental Botany (1996), 47(305), 1845-1852
CODEN: JEBOA6; ISSN: 0022-0957
PUBLISHER: Oxford University Press
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Senescence was induced in leaves of Arabidopsis thaliana by transferring rosettes from a nutrient-sufficient medium to water. A visible gradient of yellowing along the shoot axis became apparent within 5 days. Leaves were grouped into four age-classes, representing fully green (nodes 17-20) through about one-third (nodes 13-16) and one-half (9-12) to more than 80% yellow (5-8). The decrease in chlorophyll and **carotenoid** content with increasing tissue senescence was accompanied by a loss of total protein and of specific polypeptides identified by electrophoresis and Western blotting. Heterogeneity in the rates at which photosynthetic proteins decreased during senescence could be related to differences in susceptibility to proteolysis conferred by location (sol. proteins are more labile than membrane components) and assocn. with stabilizing components such as pigments. The abundance of senescence-related mRNAs was detd. by Northern anal. using heterologous DNA probes and also cDNAs isolated from Arabidopsis by differential library screening. Expression of the plastid **gene** psbA increased until the most extreme stage of senescence, in contrast to the pattern of the protein it encodes, D1, which was almost undetectable in all but mature green tissue. Transcripts corresponding to two senescence-enhanced cDNAs from Brassica napus, LSC54 and LSC94, were strongly up-regulated in senescing Arabidopsis leaves. Two Arabidopsis cDNAs, LdeVA8 and LdeVA32, detected mRNAs of increasing abundance up to mid-senescence and decreasing thereafter. Another homologous clone, LdeVA43, hybridized with a transcript showing some enhancement in early senescence. Partial base sequences of LdeVA8 and LdeVA32 revealed homologies with **genes** encoding a metallothionein-like protein and **catalase**, resp. LSC54 also encodes a putative metallothionein. The possible significance of the patterns of **gene** expression in senescing rosette leaves of A. thaliana is discussed.

L36 ANSWER 18 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 7
ACCESSION NUMBER: 97:12836 SCISEARCH
THE GENUINE ARTICLE: VY236
TITLE: Antioxidants in the treatment of schizophrenia
AUTHOR: Mahadik S P (Reprint); Gowda S
CORPORATE SOURCE: VET AFFAIRS MED CTR, DEPT PSYCHIAT, MED RES SERV 151R, 1 FREEDOM WAY, AUGUSTA, GA 30904 (Reprint); VET AFFAIRS MED CTR, PSYCHIAT SERV, AUGUSTA, GA 30904; MED COLL GEORGIA, DEPT PSYCHIAT & HLTH BEHAV, AUGUSTA, GA 30912
COUNTRY OF AUTHOR: USA
SOURCE: DRUGS OF TODAY, (OCT-NOV 1996) Vol. 32, No. 7, pp. 553-565

Publisher: J R PROUS SA, APARTADO DE CORREOS 540, PROVENZA 388, 08025 BARCELONA, SPAIN.
ISSN: 0025-7656.
DOCUMENT TYPE: General Review; Journal
FILE SEGMENT: CLIN
LANGUAGE: English
REFERENCE COUNT: 119

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Evidence is increasing to support free radical, primarily oxyradical (e.g., O-2(.-), (OH)-O-., NO., ONOO-)-mediated cellular injury in schizophrenia. The evidence indicates that increased oxidative stress (mismatch between oxyradical generation and cellular antioxidant defense) exists even at or before the onset of psychosis. Furthermore, since neuroleptic treatment increases tardive dyskinesias (TD) in patients and increases oxidative stress in animals, TD is considered to be a result of neuroleptic treatment-mediated oxidative damage. However, TD is also observed in patients without neuroleptic treatment. These facts suggest that the use of antioxidants at early stages of psychoses as well as from the initiation of neuroleptic treatment may prove to be more beneficial for the treatment and management of schizophrenia. Since neuroleptics remain the drugs of choice for the treatment of psychoses and they can further increase oxidative stress, an adjunctive antioxidant treatment may be the preferred choice at present.

Oxidative stress can increase peroxidative damage of plasma membrane phospholipids, proteins and DNA. The brain is more vulnerable to oxidative injury than any other tissues since: ii is enriched in phospholipids and proteins that are more susceptible to oxidative damage. Also, since neurons in the adult brain do not divide, oxidative DNA damage cannot be repaired. This can lead to altered **gene** expression and eventually to cell death.

Under normal circumstances, the cellular antioxidant defense system is (**superoxide dismutase**, glutathione peroxidase, **catalase**, glutathione and urate) and exogenous antioxidants primarily available through diet (vitamins A, C and E, quinones and beta-**carotene**) should be adequate for protection against oxyradical-mediated cellular damage. However, when there is an increased oxidative damage owing to increased oxidative stress, the use oi adequate quantities oi exogenous dietary and pharmacological antioxidants may prevent the oxidative brain damage. Unfortunately, in schizophrenia, the use of such antioxidants has been thus far limited to the treatment of TD. It is important that physicians, caretakers and family members recognize the use of antioxidants for the treatment and management oi schizophrenic illness, Such use may improve the course and outcome oi illness and substantially reduce the costs of lifetime treatment and management oi schizoprenia. it can also improve the quality of life of these young patients and their families.

L36 ANSWER 19 OF 49 MEDLINE on STN DUPLICATE 8
ACCESSION NUMBER: 96341550 MEDLINE
DOCUMENT NUMBER: PubMed ID: 8731339
TITLE: The effect of light on the biosynthesis of beta-**carotene** and **superoxide dismutase** activity in the photosynthetic alga Gonyaulax polyedra.
AUTHOR: Hollnagel H C; Di Mascio P; Asano C S; Okamoto O K; Stringher C G; Oliveira M C; Colepicolo P
CORPORATE SOURCE: Departamento de Bioquimica, Universidade de Sao Paulo, Brasil.
SOURCE: Brazilian journal of medical and biological research =

Revista brasileira de pesquisas medicas e biologicas / Sociedade Brasileira de Biofisica ... [et al.], (1996 Jan) 29 (1) 105-10.
Journal code: 8112917. ISSN: 0100-879X.
PUB. COUNTRY: Brazil
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199612
ENTRY DATE: Entered STN: 19970128
Last Updated on STN: 19970128
Entered Medline: 19961203

AB Daily oscillations of both beta-**carotene** and **superoxide dismutase** (SOD) activity are related to the intracellular control of reactive oxygen species (ROS). It is well established that ROS are present in all aerobic cells. We studied the marine dinoflagellate Gonyaulax polyedra which has been extensively used as a model to understand the biological clock at the molecular level. beta-**Carotene**, besides suppressing singlet molecular oxygen (1O2), may act as a photoreceptor pigment in many photosynthetic cells. The levels of beta-**carotene** during the day phase were shown to be twice as high as during the night phase. The dose-response curve for light-induced **carotenoid** synthesis was linear for up to 45 min of light exposure, after which night phase cells contained the same levels of beta-**carotene** as day phase cells. Cells exposed to light pulses at different times during the dark period displayed the highest beta-**carotene** induction in the middle of the night. SOD activity of cell-free extracts of G. polyedra was three to four times higher during the day. This rhythm continued in cells kept in constant light, indicating that the regulation can be attributed to the cellular circadian clock. No-denaturing polyacrylamide gels revealed the presence of several SOD isoenzymes in G. polyedra, including CuZnSOD and MnSOD. Furthermore, G. polyedra SOD cross-reacts with a polyclonal antibody raised against SOD. In addition to being **gene** regulated by ROS concentration, G. polyedra SOD expression seems also to be under the control of the biological clock.

L36 ANSWER 20 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 96:408310 SCISEARCH
THE GENUINE ARTICLE: UM379
TITLE: THERAPEUTIC OPPORTUNITIES IN AMYOTROPHIC-LATERAL-SCLEROSIS
AUTHOR: EISEN A (Reprint)
CORPORATE SOURCE: VANCOUVER GEN HOSP, NEUROMUSCULAR DIS UNIT, VANCOUVER, BC V5Z 1M9, CANADA; UNIV BRITISH COLUMBIA, VANCOUVER, BC V5Z 1M9, CANADA
COUNTRY OF AUTHOR: CANADA
SOURCE: NEUROLOGIST, (MAR 1996) Vol. 2, No. 2, pp. 85-95.
ISSN: 1074-7931.
DOCUMENT TYPE: General Review; Journal
LANGUAGE: ENGLISH
REFERENCE COUNT: 121

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB BACKGROUND- Treatment for amyotrophic lateral sclerosis (ALS) has traditionally been symptomatic. Large numbers of previous drug trials have proven negative. This discouraging picture is changing dramatically, and, for the first time, therapies that hold true promise are appearing.

REVIEW SUMMARY- This article reviews recent and ongoing therapeutic strategies for ALS. Most relevant are glutamate antagonists, exemplified by riluzole, and the use of neurotrophic factors such as insulin-like growth factor 1 and brain-derived neurotrophic factor. Additionally, antioxidants and nonsteroidal anti-inflammatory agents such as aspirin may play an important role. Some medications have possible or proven neuroprotective properties. They include vitamin E, **carotenes**, flavonoids, deprenyl, and dehydroepiandrosterone. They should be implemented early in the course of ALS. Supportive measures continue to be important. Early gastrostomy is recommended, and the use of biphasic positive airway pressure should be implemented when vital capacity falls below 50% of normal.

CONCLUSION- It is likely that ALS has a multifactorial etiopathogenesis and may be more heterogeneous than previously recognized. As a result, it is unlikely that a single therapy will ever prove to be of major benefit,

and efforts must be directed toward combination therapies.

L36 ANSWER 21 OF 49 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED.
on STN
ACCESSION NUMBER: 96138634 EMBASE
DOCUMENT NUMBER: 1996138634
TITLE: Blood **superoxide dismutase, catalase** and glutathione peroxidase activities in familial and sporadic amyotrophic lateral sclerosis.
AUTHOR: Przedborski S.; Donaldson D.M.; Murphy P.L.; Hirsch O.; Lange D.; Naini A.B.; McKenna-Yasek D.; Brown Jr. R.H.
CORPORATE SOURCE: Department of Neurology, College of Physicians and Surgeons, Columbia University, 650 West 168th Street,New York, NY 10032, United States
SOURCE: Neurodegeneration, (1996) 5/1 (57-64).
ISSN: 1055-8330 CODEN: NEURFN
COUNTRY: United Kingdom
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 005 General Pathology and Pathological Anatomy
008 Neurology and Neurosurgery
022 Human Genetics
029 Clinical Biochemistry
037 Drug Literature Index
LANGUAGE: English
SUMMARY LANGUAGE: English
AB Recent studies have implicated free radicals in the pathogenesis of amyotrophic lateral sclerosis (ALS), a fatal, paralytic disorder of motor neurons. Herein we report on measurements of erythrocyte activity of the three main free radical scavenging enzymes: copper/zinc **superoxide dismutase** (Cu/Zn-SOD), **catalase**, and glutathione peroxidase. We studied 31 patients with sporadic ALS, 18 with familial ALS, and 24 controls, Mean Cu/Zn-SOD activity was reduced in eight familial ALS patients with mutations of Cu/Zn-SOD but was normal in patients with both familial ALS without identified Cu/Zn-SOD mutations and sporadic ALS. Glutathione peroxidase activity was significantly reduced only in sporadic ALS patients treated with insulin-like growth factor I (100 .mu.g/kg). **Catalase** activity was normal in sporadic and familial ALS. Neither glutathione peroxidase nor **catalase** activities correlated significantly with duration of symptoms or age at onset. Vitamin E, vitamin C, and .beta.-**carotene** did not affect any of the three enzyme activities. These observations indicate that disturbances of **catalase** and glutathione peroxidase function are not Likely to be central factors in the pathogenesis of ALS.

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on STN
ACCESSION NUMBER: 96207361 EMBASE
DOCUMENT NUMBER: 1996207361
TITLE: [Current aspects of cancer therapy].
AKTUELLE ASPEKTE ZUR KREBSTHERAPIE.
AUTHOR: Van Gessel A.
SOURCE: Pharmazeutische Zeitung, (1996) 141/27 (34-42).
ISSN: 0031-7136 CODEN: PZSED5
COUNTRY: Germany
DOCUMENT TYPE: Journal; (Short Survey)
FILE SEGMENT: 016 Cancer
022 Human Genetics
030 Pharmacology
037 Drug Literature Index
LANGUAGE: German
SUMMARY LANGUAGE: German

L36 ANSWER 23 OF 49 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED.
on STN
ACCESSION NUMBER: 96073163 EMBASE
DOCUMENT NUMBER: 1996073163
TITLE: Role of oxygen free radicals in cancer development.
AUTHOR: Dreher D.; Junod A.F.
CORPORATE SOURCE: Laboratoire de Pneumologie, Departement Medicine I, Hopital Cantonal Universitaire,Geneva, Switzerland
SOURCE: European Journal of Cancer Part A: General Topics, (1996)

32/1 (30-38).
ISSN: 0959-8049 CODEN: EJCTEA
COUNTRY: United Kingdom
DOCUMENT TYPE: Journal; General Review
FILE SEGMENT: 016 Cancer
037 Drug Literature Index
LANGUAGE: English
SUMMARY LANGUAGE: English

AB In aerobic life, oxidative stress arises from both endogenous and exogenous sources. Despite antioxidant defence mechanisms, cell damage from oxygen free radicals (OFR) is ubiquitous. OFR-related lesions that do not cause cell death can stimulate the development of cancer. This review discusses the effects of oxidative stress at the different stages of carcinogenesis. Mutagenesis through oxidative DNA damage is widely hypothesised to be a frequent event in the normal human cell. A large body of evidence suggests important roles of OFR in the expansion of tumour clones and the acquisition of malignant properties. In view of these facts, OFR may be considered as an important class of carcinogens. Therefore, the ineffectiveness of preventive antioxidant treatments, as documented in several recent clinical trials, is surprising. However, the difficulties of antioxidant intervention are explained by the complexity of both free radical chemistry and cancer development. Thus, reducing the avoidable endogenous and exogenous causes of oxidative stress is, for the present, the safest option. In the near future, new insights in the action of tumour suppressor **genes** and the DNA repair mechanisms may lead the way to additional tools against carcinogenesis from OFR.

L36 ANSWER 24 OF 49 MEDLINE on STN DUPLICATE 9
ACCESSION NUMBER: 95369243 MEDLINE
DOCUMENT NUMBER: PubMed ID: 7641690
TITLE: Reduction of coproporphyrinogen oxidase level by antisense RNA synthesis leads to deregulated **gene** expression of plastid proteins and affects the oxidative defense system.
AUTHOR: Kruse E; Mock H P; Grimm B
CORPORATE SOURCE: Institut fur Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany.
SOURCE: EMBO journal, (1995 Aug 1) 14 (15) 3712-20.
Journal code: 8208664. ISSN: 0261-4189.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199509
ENTRY DATE: Entered STN: 19950930
Last Updated on STN: 19950930
Entered Medline: 19950915

AB A full-length cDNA sequence encoding coproporphyrinogen oxidase was inserted in inverse orientation behind a CaMV promoter and transferred to tobacco (Nicotiana tabacum) by standard transformation techniques. Transformants showed reduced coproporphyrinogen oxidase activity and accumulation of photosensitive coproporphyrin(ogen), indicating antisense RNA expression. An inverse correlation was observed between the level of coproporphyrinogen oxidase and transformant phenotype. The latter is characterized by a broad range of growth retardation and necrosis, indicating oxidative leaf damage. Coproporphyrinogen is an apparent chromophore and its excitation finally leads to the production of reactive oxygen. Evidence is presented that indicates a direct correlation between the accumulation of non-metabolized coproporphyrinogen and oxidative damage to cellular structural components. Enzymatic and non-enzymatic antioxidants were investigated. Whereas **superoxide dismutase** activity increased in transgenic plants, **catalase** and ascorbate peroxidase activity remained constant. Tocopherol, rather than **carotene** or zeaxanthin, seemed to be involved in detoxification, indicating the putative localization and allocation of coproporphyrinogen. Expression of coproporphyrinogen oxidase antisense RNA did not significantly influence the level of other enzymes in the chlorophyll metabolic pathway, but deregulated **gene** expression of nuclear encoded plastid proteins. Accumulation of coproporphyrinogen and/or the resulting effects, such as oxidative stress, impairs a plastid/nuclear signal which may adapt **gene** expression

to the plastid state.

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ACCESSION NUMBER: 95341102 EMBASE
DOCUMENT NUMBER: 1995341102
TITLE: Clastogenic factors in plasma of HIV-1 infected patients.
AUTHOR: Fuchs J.; Emerit I.; Levy A.; Cernajvski L.; Schofer H.; Milbradt R.
CORPORATE SOURCE: Heinsestrasse 8,63739 Aschaffenburg, Germany
SOURCE: Free Radical Biology and Medicine, (1995) 19/6 (843-848). ISSN: 0891-5849 CODEN: FRBMEH
COUNTRY: United States
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 026 Immunology, Serology and Transplantation
029 Clinical Biochemistry
037 Drug Literature Index
LANGUAGE: English
SUMMARY LANGUAGE: English

AB The objective of this study was to investigate the clastogenic activity of plasma ultrafiltrates from HIV-1 infected patients. Clastogenic factors are chromosome-damaging agents with low molecular weight (<10,000 daltons) which cause chromosome aberrations, sister chromatid exchanges, DNA strand breakage, and **gene** mutation. They have first been described in the plasma of irradiated persons, but they are also found in hereditary breakage syndromes and chronic inflammatory diseases with autoimmune reactions. Their formation and their clastogenic effects are modulated by superoxide anion radicals. We analyzed a total of 22 HIV-1 positive patients in comparison to 20 reference plasma samples from healthy HIV negative blood donors of similar age. The plasma ultrafiltrates (filter cutoff 10,000 daltons) from patients induced a statistically significant increase in chromosomal breakage in the cytogenetic test system (20.5 .+-. 6.8 aberrations per 100 cells), while no increase was observed in test cultures exposed to plasma ultrafiltrates from healthy blood donors (6.3 .+-. 2.9 aberrations per 100 cells). The breakage values were slightly, but not significantly, lower in the 10 patients with more than 200 T-helper cells/ml (18 .+-. 4 aberrations per 100 cells), than in the 12 patients with less than 200 T-helper cells/ml (22.3 .+-. 7.9 aberrations per 100 cells). HIV patients with high clastogenic activity (induction of more than 20 aberrations per 100 cells, range 20 to 39) showed higher plasma levels for malondialdehyde than those with lower clastogenic activity (less than 20 aberrations per 100 cells, range 12 to 18). However, the difference was statistically not significant. Another lipid peroxidation product, 4- hydroxynonenal, was increased equally in both groups. There were no significant differences in water- and lipid-soluble plasma antioxidants between the low- and high-breakage group. In agreement with previous findings, the clastogenic effects of plasma ultrafiltrates in the test cultures were reduced by the antioxidant enzyme **superoxide dismutase**. The presence of clastogenic factors in the plasma of HIV patients is further evidence for a prooxidant state in these persons. Since clastogenic factor formation appears to occur at an early stage of the disease, it may be significant for virus release or activation, because of the superoxide union stimulating effects of clastogenic factors. From a practical standpoint, clastogenic factors may be useful for evaluation of promising drugs.

L36 ANSWER 26 OF 49 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
ACCESSION NUMBER: 1996:269834 BIOSIS
DOCUMENT NUMBER: PREV199698825963
TITLE: Oxidative stress and HIV infection: Precisions on a concept and a new therapeutic approach.
AUTHOR(S): Constans, J. [Reprint author]; Conri, C.; Pellegrin, J.-L.; Sergeant, C.; Simonoff, M.; Peuchant, E.; Dubourg, L.; Thomas, M.-J.; Pellegrin, I.; Brossard, G.; Barbeau, P.; Amara, A.; Geffard, M.; Clerc, M.; Fleury, H.; Leng, B.
CORPORATE SOURCE: Serv. des Maladies Infectieuses, Hopital Pellegrin, F-33075 Bordeaux Cedex, France
SOURCE: Annales de Medecine Interne, (1995) Vol. 146, No. 7, pp. 514-520.
CODEN: AMDIBO. ISSN: 0003-410X.
DOCUMENT TYPE: Article

General Review; (Literature Review)
LANGUAGE: French
ENTRY DATE: Entered STN: 10 Jun 1996
Last Updated on STN: 10 Jun 1996

L36 ANSWER 27 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 96:106627 SCISEARCH
THE GENUINE ARTICLE: BE52C
TITLE: FUNGAL RESISTANCE TO PHOTOSENSITIZERS THAT GENERATE SINGLET OXYGEN
AUTHOR: DAUB M E (Reprint); JENNS A E; EHRENSHAFT M
CORPORATE SOURCE: N CAROLINA STATE UNIV, DEPT PLANT PATHOL, BOX 7616, RALEIGH, NC, 27695 (Reprint)
COUNTRY OF AUTHOR: USA
SOURCE: ACS SYMPOSIUM SERIES, (1995) Vol. 616, pp. 201-216. ISSN: 0097-6156.
DOCUMENT TYPE: General Review; Journal
FILE SEGMENT: AGRI
LANGUAGE: ENGLISH
REFERENCE COUNT: 76
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Fungi in the genus Cercospora synthesize a photoactivated perylenequinone toxin, cercosporin, which plays an important role in the ability of these organisms to parasitize plants. In the presence of light, cercosporin generates singlet oxygen, and is toxic to plants, mice, bacteria, and many fungi. Cercospora species, however, are resistant to high concentrations of cercosporin. Targeted **gene** disruption of the Cercospora phytoene dehydrogenase **gene** revealed no role for **carotenoids** in cercosporin resistance. By contrast, resistance is highly correlated with the ability of these fungi to transiently reduce and detoxify cercosporin. Mutants which are deficient in resistance to cercosporin have been isolated. These mutants are also sensitive to five other singlet oxygen generating photosensitizers. The mutants are being used to identify **genes** for photosensitizer resistance using mutant complementation. Once identified, these **gene**(s) can be used to determine whether resistance is targeted against the photosensitizer molecule or singlet oxygen itself.

L36 ANSWER 28 OF 49 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
ACCESSION NUMBER: 1995:167741 BIOSIS
DOCUMENT NUMBER: PREV199598182041
TITLE: **Gene** expression in acute myocardial stress, Induction by hypoxia, ischemia, reperfusion, hyperthermia and oxidative stress.
AUTHOR(S): Das, Dipak K. [Reprint author]; Maulik, Nilanjana; Moraru, Ion I.
CORPORATE SOURCE: Cardiovascular Div., Dap. Surgery, Univ. Connecticut Sch. Med., Farmington, CT 06030-1110, USA
SOURCE: Journal of Molecular and Cellular Cardiology, (1995) Vol. 27, No. 1, pp. 181-193.
CODEN: JMCDAY. ISSN: 0022-2828.
DOCUMENT TYPE: Article
General Review; (Literature Review)
LANGUAGE: English
ENTRY DATE: Entered STN: 26 Apr 1995
Last Updated on STN: 27 Apr 1995

L36 ANSWER 29 OF 49 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED. on STN
ACCESSION NUMBER: 95117354 EMBASE
DOCUMENT NUMBER: 1995117354
TITLE: Inhibition of the induction of cancer by antioxidants.
AUTHOR: Slaga T.J.
CORPORATE SOURCE: Science Park - Research Division, M.D. Anderson Cancer Center, University of Texas,Smithville, TX 78757, United States
SOURCE: Advances in Experimental Medicine and Biology, (1995) 369/-(167-174).
ISSN: 0065-2598 CODEN: AEMBAP
COUNTRY: United States
DOCUMENT TYPE: Journal; General Review

FILE SEGMENT: 016 Cancer
037 Drug Literature Index
LANGUAGE: English
SUMMARY LANGUAGE: English
AB Many different antioxidants have been shown to inhibit the induction of cancer by a wide variety of chemical carcinogens and/or radiation at many target sites in mice, rats, and hamsters. Evidence is accumulating that suggests that free radicals are important in all stages of chemical carcinogenesis. Both carcinogens and tumor promoters have also been shown to decrease the cellular activity of **superoxide dismutase** and **catalase**. A number of antioxidants and related compounds were tested to determine if they would inhibit either skin tumor initiation, promotion, and/or progression. In terms of skin tumor initiation, BHT, vitamin E and C and CuDIPS have been found to inhibit DMBA skin tumor initiation by approximately 50%. The mechanism of action of these compounds appears to be related to their effect on the metabolism of DMBA, since BHT and CuDIPS do not inhibit the initiating activity of BP-diol-epoxide and MNNG. Although several antioxidants do inhibit skin tumor initiation by procarcinogens, antioxidants are in general much more effective inhibitors of skin tumor promotion. BHT, BHA, parahydroxyanisole, disulfiran, and vitamin E and C inhibit skin tumor promotion by TPA and benzoyl peroxide by greater than 90%. We also determined the effect of free radical scavengers on the progression process. Of the agents tested glutathione and N-acyl dehydroalamines were the most effective in reducing carcinoma incidence. Diethyl maleate, a chemical that reduces glutathione levels, was effective in enhancing progression. In addition overexpression of g-glutamylt-ranspeptidase (GGT) which leads to a reduction in cellular glutathione levels also enhances progression. These results suggest that GGT has a functional role in skin tumor progression, and that a number of antioxidants are either effective inhibitors of skin tumor initiation, promotion, and/or progression.

L36 ANSWER 30 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:845137 CAPLUS
DOCUMENT NUMBER: 123:311244
TITLE: Strategies of antioxidant defense: Relations to oxidative stress
AUTHOR(S): Sies, Helmut
CORPORATE SOURCE: Institut fur Physiologische Chemie I, Heinrich-Heine-Universitat Dusseldorf, Duesseldorf, D-40001, Germany
SOURCE: NATO ASI Series, Series H: Cell Biology (1995), 92(Signalling Mechanisms), 165-86
CODEN: NASBE4; ISSN: 1010-8793
PUBLISHER: Springer
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English
AB A review with 97 refs. Oxidants and antioxidants have attracted widespread interest in diverse scientific disciplines, ranging from free radical chem. to biochem., nutrition research, biol., and medicine. Life on this planet utilizes oxygen and oxygen metabolites in energy conversion, and it has become clear that const. generation of pro-oxidants, including oxygen free radicals, is an essential attribute of aerobic life. This challenge is met by a system of antioxidants which help to maintain the steady state of the living organism. A disturbance in the pro-oxidant/antioxidant system has been defined as "oxidative stress". Operationally, a useful definition would also include that the disbalance in favor of the pro-oxidants is assocd. with potential damage to the biol. system. Damage products as indicators of oxidative stress include damaged DNA bases, protein oxidn. products, and products of lipid peroxidn. A loss of antioxidant capacity may concern enzymic defense, e.g., **superoxide dismutase**, glutathione peroxidases, or **catalase**, or a weakening of nonenzymic defense, notably the loss of micronutrients such as vitamins C and E, **carotenoids**, and selenium. An interesting aspect resides in the modulation of **gene** expression by oxidative stress. In consequence, this leads to new therapeutic concepts of employing compds. active as antioxidants. One example is the GSH peroxidase mimic, ebselen, a seleno-org. compd.

L36 ANSWER 31 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1995:677972 CAPLUS

DOCUMENT NUMBER: 123:101823
TITLE: Oxidative stress, HIV and aids: The basis for antioxidant-oriented antiretroviral nucleoside analogs
AUTHOR(S): Abou-Shaaban, Rafiq R. A.
CORPORATE SOURCE: College Pharmacy, King Saud University, Riyadh, 11451, Saudi Arabia
SOURCE: Saudi Pharmaceutical Journal (1995), 3(1-2), 1-22
CODEN: SPJOEM; ISSN: 1319-0164
PUBLISHER: Saudi Pharmaceutical Society
DOCUMENT TYPE: Journal; General Review
LANGUAGE: English

AB A review, with 186 refs. The HIV seropos. patients are under systemic and intracellular oxidative stress as a result of an excessive prodn. of reactive oxygen species (ROS) combined with the deficiencies of endogenous antioxidants such as glutathione (GSH), cysteine, vitamin E, **carotenoids**, zinc-,manganese-contg. **superoxide dismutase** (Mn-SOD), selenium-contg. GSH peroxidase and **catalase** in the T-cell subsets. The different sources of ROS in AIDS patients are the activated leukocytes, cytokines and drugs required to control HIV progression, assocd. infections and cancers. Several reports suggest the involvement of ROS activated cytoplasmic factors such as nuclear factor .kappa.B (NF-.kappa.B) and tumor necrosis factor .alpha. (TNF-.alpha.) in the regulation of HIV replication. Since the discovery of retroviral cause for AIDS, a wide variety of agents capable of inhibiting different sites of viral life cycle were discovered. These agents were found to possess diverse chem. structures and works on different viral or host targets. The viral targets are either specific enzymes (reverse transcriptase, protease or glucosidase) or viral processes (**gene** expression, viral binding or viral budding) which interfere with the viral multiplication. The retroviral reverse transcriptase has been a popular target for the design and synthesis of anti-HIV drugs. Recent studies have focused on an intracellular target, the NF-.kappa.B, whose stimulation is related to the lowering of the endogenous antioxidant defense system and stimulation of the HIV expression. In spite of the myriad of known synthetic and/or natural inhibitors of HIV over the last decade, the AIDS virus still successfully elude all forms of curative therapy. Replenishing antioxidants will have a preventive role in different stages of AIDS disease, assocd. infections and cancers. The beneficial effect of free radical scavengers depend on biol. compatibility, the dosage used and the appropriate delivery systems that will allow the scavenger to act at the cellular and tissue sites where the free radicals are interfering with the normal function and causing injury. In this report, the author wishes to review the justification for a novel anti-AIDS class "Antioxidant-oriented Antiretroviral Nucleoside Analogs" that might provide curative therapy. These drugs will act by inhibiting both the reverse transcriptase viral target and host-mediated stimulation of viral replication. Accordingly, the prospective compds. will block the formation of provirus, extend the latency, after HIV integration into host genome, and inhibit viral expression. The required structural specification will be discussed. In addn. the pos. effects of the prospective drugs that might lead to the curative therapy are also outlined.

L36 ANSWER 32 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1994:646338 CAPLUS
DOCUMENT NUMBER: 121:246338
TITLE: **Superoxide dismutase gene** mutations as causes of neurodegenerative diseases and compounds and methods for the diagnosis, treatment, and prevention of the diseases
INVENTOR(S): Brown, Robert; Horvitz, H. Robert; Rosen, Daniel R.
PATENT ASSIGNEE(S): General Hospital Corp., USA; Massachusetts Institute of Technology
SOURCE: PCT Int. Appl., 98 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

WO 9419493	A1	19940901	WO 1994-US2089	19940228
W: CA, JP				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
US 5843641	A	19981201	US 1993-23980	19930226
CA 2157041	AA	19940901	CA 1994-2157041	19940228
EP 686203	A1	19951213	EP 1994-910183	19940228
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE				
JP 08510377	T2	19961105	JP 1994-519309	19940228
US 5849290	A	19981215	US 1995-486953	19950607

PRIORITY APPLN. INFO.: US 1993-23980 19930226
US 1994-204052 19940228
WO 1994-US2089 19940228

AB Disclosed is the family of **genes** responsible for the neurodegenerative diseases, particularly amyotrophic lateral sclerosis (ALS). Methods and compds. for the diagnosis, prevention, and therapy of the disease are also disclosed. Uses of the compds. in the prepn. of diagnostic and therapeutic medicaments are also provided. Fourteen different SOD1 missense mutations in 16 different familial ALS families were identified. The mutations were identified by PCR followed by single-strand conformational polymorphism anal. The most common single mutation was an Ala-4 to Val substitution in exon 1. This mutation reduced the total SOD activity by 50% compared to normal controls. Addnl. polymorphisms were identified in exons 3 and 4 as well as in intron 3. Some of these mutations are detectable by restriction fragment length polymorphism.

L36 ANSWER 33 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 94:200314 SCISEARCH
THE GENUINE ARTICLE: NC918
TITLE: MOLECULAR RESPONSES TO PHOTOOXIDATIVE STRESS IN PINUS-SYLVESTRIS .1. DIFFERENTIAL EXPRESSION OF NUCLEAR AND PLASTID **GENES** IN RELATION TO RECOVERY FROM WINTER STRESS
AUTHOR: KARPINSKI S (Reprint); KARPINSKA B; WINGSLE G; HALLGREN J E
CORPORATE SOURCE: SWEDISH UNIV AGR SCI, FAC FORESTRY, DEPT FOREST GENET & PLANT PHYSIOL, S-90183 UMEA, SWEDEN (Reprint)
COUNTRY OF AUTHOR: SWEDEN
SOURCE: PHYSIOLOGIA PLANTARUM, (FEB 1994) Vol. 90, No. 2, pp. 358-366.
ISSN: 0031-9317.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: ENGLISH
REFERENCE COUNT: 43

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Inhibition of photosynthesis plays an important role during winter-spring stress in evergreen plants such as Scots pine (Pinus sylvestris L.). In this experiment, naturally established three-year-old Scots pine seedlings were studied during recovery from winter stress, under natural conditions from May to the beginning of June. A comparison was made between top shoot needles exposed to sun and, prior to winter stress recovery snow-covered, and thus more shaded side shoot needles. Chlorophyll fluorescence, photochemical and non-photochemical quenching, pigment composition together with the Lhca2*1, Lhcb1*2, RbcS, rbcL, psbA, nad3 and cox2 **gene** expression were analysed. During the recovery, a general increase in the F(v)/F(m) ratio of chlorophyll fluorescence and in pigments was observed for both types of shoots. At the beginning of May, the F(v)/F(m) ratio of chlorophyll fluorescence showed that exposed top shoot needles were more photoinhibited than the snow-covered side shoot needles. The levels of chlorophyll a and b, neoxanthin, alpha- and beta-**carotene** were lower, while the level of zeaxanthin was higher in top shoot needles than in side shoot needles during the whole period. On May 6, significantly higher (two-fold) mRNA levels for Lhca2*1 and Lhcb1*2 **genes** were detected in top shoot needles than in side shoot needles. The reverse situation for these **genes** was observed on May 19 with a two-fold higher level of mRNA in side shoot needles. The transcript level was significantly higher for the Lhcb1*2 **gene** than for the Lhca2*1 **gene** in both types of shoots only at the beginning of May. The mRNA level for the RbcS

gene on May 4 and 6 was two- and four-fold higher, respectively, in top than in side shoot needles. The transcript levels for the plastid-encoded rbcL and psbA and for the mitochondrion-encoded nad3 and cox2 **genes** were constant and similar in top and side shoot needles. The results are discussed in relation to recovery from winter-spring stress and observed differential expression of nuclear- and organellar-encoded **genes**.

L36 ANSWER 34 OF 49 LIFESCI COPYRIGHT 2004 CSA on STN
ACCESSION NUMBER: 97:8898 LIFESCI
TITLE: Acclimation of the photosynthetic apparatus to growth irradiance in a mutant strains of Synechococcus lacking iron **superoxide dismutase**
AUTHOR: Samson, G.; Herbert, S.K.; Fork, D.C.; Laudenbach, D.E.*
CORPORATE SOURCE: Dep. Plant Sci., Univ. Western Ontario, 1151 Richmond St. North, London, Ontario N6A 5B7, Canada
SOURCE: PLANT PHYSIOL., (1994) vol. 105, no. 1, pp. 287-294.
DOCUMENT TYPE: Journal
FILE SEGMENT: G; K
LANGUAGE: English
SUMMARY LANGUAGE: English
AB The acclimation of the photosynthetic apparatus to growth irradiance in a mutant strain of Synechococcus sp. PCC 7942 lacking detectable iron **superoxide dismutase** activity was studied. The growth of the mutant was inhibited at concentrations of methyl viologen 4 orders of magnitude smaller than those required to inhibit the growth of the wild-type strain. An increased sensitivity of photosynthetic electron transport near photosystem I (PSI) toward photooxidative stress was also observed in the mutant strain. In the absence of methyl viologen, the mutant exhibited similar growth rates compared with those of the wild type, even at high growth irradiance (350 mu E m super(-2) s super(-1)) were chronic inhibition of photosystem II (PSII) was observed in both strains. Under high growth irradiance, the ratios of PSII to PSI and of alpha -phycocyanin to chlorophyll a were less than one-third of the values for the wild type. In both strains, cellular contents of chlorophyll a, alpha -phycocyanin, and beta **-carotene**, as well as the length of the phycobilisome rods, declined with increasing growth irradiance. Only the cellular content of the **carotenoid** zeaxanthin seemed to be independent of growth irradiance. These results suggest an altered acclimation to growth irradiance in the sodB mutant in which the stoichiometry between PSI and PSII is adjusted to compensate for the loss of PSI efficiency occurring under high growth irradiance. Similar shortening of the phycobilisome rods in the sodB mutant and wild-type strain suggest that phycobilisome rod length is regulated independently of photosystem stoichiometry.

L36 ANSWER 35 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 95:63522 SCISEARCH
THE GENUINE ARTICLE: QA700
TITLE: AGING - PROSPECTS FOR FURTHER INCREASES IN THE FUNCTIONAL LIFE-SPAN
AUTHOR: HARMAN D (Reprint)
CORPORATE SOURCE: UNIV NEBRASKA, COLL MED, DEPT MED, 600 S 42ND ST, OMAHA, NE, 68198 (Reprint)
COUNTRY OF AUTHOR: USA
SOURCE: AGE, (OCT 1994) Vol. 17, No. 4, pp. 119-146.
ISSN: 0161-9152.
DOCUMENT TYPE: General Review; Journal
FILE SEGMENT: LIFE
LANGUAGE: ENGLISH
REFERENCE COUNT: 279
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
AB Life spans in the developing countries now range from 76-79 years, 6-9 years less than the limit of 85 years imposed by aging. Aging is the accumulation of changes that increase the risk of death. Aging changes can be attributed to development, genetic defects, the environment, disease, and the major contributor, the inborn aging process. In 1954 the free radical theory of aging proposed that aging was caused by free radical reactions. Support for this theory is now extensive. There is a growing consensus that the theory is correct and that in mammals, aging is the accumulation of deleterious changes produced by free radical reactions,

most initiated by the mitochondria (at an increasing rate with age), while the life span is determined by the rate of such damage to the mitochondria. This consensus bodes well for future efforts to increase the functional life span, i.e., the period of healthy, productive life. Some of the data which resulted in this consensus are presented.

Studies based on the free radical theory of aging suggest that the average life expectancy at birth (ALE-B), a rough measure of the functional life span, can be increased in the developed countries (in addition to the 3-5 years that may optimistically still be achieved by conventional measures), so as to more closely approach the potential ''natural'' maximum value of 85 years- and to exceed it if the aging process is slowed. This can be accomplished by: 1) keeping body weight down, at a level compatible with a sense of well-being, 2) ingesting diets adequate in essential nutrients and designed to minimize random damaging free radical reactions in the body, 3) supplementing the diet with one or more antioxidants, e.g., beta-**carotene**, and vitamins C and E, and 4) employing measures to minimize accumulation of metals in the body capable of initiating adverse free radical reaction and of those than can impair the activity of some enzymes.

L36 ANSWER 36 OF 49 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 94125561 EMBASE
DOCUMENT NUMBER: 1994125561
TITLE: The influence of natural and experimental high O2 concentrations on O2-evolving phototrophs.
AUTHOR: Raven J.A.; Johnston A.M.; Parsons R.; Kubler J.
CORPORATE SOURCE: Department of Biological Sciences, University of Dundee,Dundee DD1 4HN, United Kingdom
SOURCE: Biological Reviews of the Cambridge Philosophical Society, (1994) 69/1 (61-94).
ISSN: 0006-3231 CODEN: BRCPAH
COUNTRY: United Kingdom
DOCUMENT TYPE: Journal; General Review
FILE SEGMENT: 004 Microbiology
022 Human Genetics
029 Clinical Biochemistry
LANGUAGE: English

L36 ANSWER 37 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN

ACCESSION NUMBER: 93:347192 SCISEARCH
THE GENUINE ARTICLE: LE386
TITLE: ARE ACTIVE OXYGEN SPECIES INVOLVED IN INDUCTION OF BETA-**CAROTENE** IN DUNALIELLA-BARDAWIL
AUTHOR: SHAISH A; AVRON M; PICK U (Reprint); BENAMOTZ A
CORPORATE SOURCE: WEIZMANN INST SCI, DEPT BIOCHEM, IL-76100 REHOVOT, ISRAEL; NATL INST OCEANOG, ISRAEL OCEANOG & LIMNOL RES, IL-31080 HAIFA, ISRAEL
COUNTRY OF AUTHOR: ISRAEL
SOURCE: PLANTA, (JUN 1993) Vol. 190, No. 3, pp. 363-368.
ISSN: 0032-0935.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: ENGLISH
REFERENCE COUNT: 24
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB The purpose of this work was to test whether induction of massive beta-**carotene** synthesis in the alga Dunaliella bardawil is triggered by oxygen radicals. The following results were obtained: (i) The induction of beta-**carotene** synthesis is preceded by a lag period of about 4 h during which the cells swell and photosynthesis is partially inhibited. (ii) Addition of promoters of oxygen radicals or of azide (an inhibitor of **catalase** and **superoxide dismutase**) during the induction period, under conditions which are suboptimal for massive beta-**carotene** accumulation, greatly enhances beta-**carotene** synthesis, photodegradation of chlorophyll and inhibition of photosynthesis. (iii) High irradiance, which induces massive beta-**carotene** accumulation, also induces a high **catalase** activity. It is suggested that photosynthetically produced oxygen radicals are involved in triggering massive beta-**carotene** accumulation in D. bardawil.

L36 ANSWER 38 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 10
ACCESSION NUMBER: 1994:266021 CAPLUS
DOCUMENT NUMBER: 120:266021
TITLE: Inheritance of antioxidant enzyme activities and pigments content during wheat maturation
AUTHOR(S): Stajner, D.; Gasic, O.; Kraljevic-Balalic, M.; Matkovics, B.
CORPORATE SOURCE: Inst. Chem., Univ. Novi Sad, Novi Sad, 21000, Yugoslavia
SOURCE: Journal of Genetics & Breeding (1993), 47(3), 259-62
CODEN: JGBREX; ISSN: 0394-9257
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Detns. were made of **superoxide dismutase**, **catalase** and peroxidase activities and chlorophyll and **carotenoid** content in 21-days old leaves and in leaves from plants at tillering stage of genetically divergent Triticum aestivum genotypes including five parents and 10 F1 hybrids. The measurements indicated that enzyme activities and pigment contents changed during maturation. **Superoxide dismutase**, peroxidase and **catalase** activities were high in 21-days old wheat leaves compared to leaves at tillering stage. Chlorophyll a content increased during maturation, whereas chlorophyll b and **carotenoid** content decreased. The inheritance of enzyme activities was mostly under the control of non-additive **genes**. Moreover in most F1 hybrids pos. or neg. heterosis for pigment content occurred.

L36 ANSWER 39 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 11
ACCESSION NUMBER: 93:641032 SCISEARCH
THE GENUINE ARTICLE: MB897
TITLE: TANSLEY REVIEW .52. THE ROLE OF ACTIVE OXYGEN IN THE RESPONSE OF PLANTS TO WATER-DEFICIT AND DESICCATION
AUTHOR: SMIRNOFF N (Reprint)
CORPORATE SOURCE: UNIV EXETER, DEPT BIOL SCI, HATHERLY LABS, PRINCE WALES RD, EXETER EX4 4PS, ENGLAND (Reprint)
COUNTRY OF AUTHOR: ENGLAND
SOURCE: NEW PHYTOLOGIST, (SEP 1993) Vol. 125, No. 1, pp. 27-58. ISSN: 0028-646X.
DOCUMENT TYPE: General Review; Journal
FILE SEGMENT: AGRI
LANGUAGE: ENGLISH
REFERENCE COUNT: 264

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Water deficits cause a reduction in the rate of photosynthesis. Exposure to mild water deficits, when relative water content (RWC) remains above 70%, primarily causes limitation to carbon dioxide uptake because of stomatal closure. With greater water deficits, direct inhibition of photosynthesis occurs. In both cases limitation of carbon dioxide fixation results in exposure of chloroplasts to excess excitation energy. Much of this can be dissipated by various photoprotective mechanisms. These include dissipation as heat via **carotenoids**, photorespiration, CAM idling and, in some species, leaf movements and other morphological features which minimize light absorption. The active oxygen species superoxide and singlet oxygen are produced in chloroplasts by photoreduction of oxygen and energy transfer from triplet excited chlorophyll to oxygen, respectively. Hydrogen peroxide and hydroxyl radicals can form as a result of the reactions of superoxide. All these species are reactive and potentially damaging, causing lipid peroxidation and inactivation of enzymes. They are normally scavenged by a range of antioxidants and enzymes which are present in the chloroplast and other subcellular compartments. When carbon dioxide fixation is limited by water deficit, the rate of active oxygen formation increases in chloroplasts as excess excitation energy, not dissipated by the photoprotective mechanisms, is used to form superoxide and singlet oxygen. However, photorespiratory hydrogen peroxide production in peroxisomes decreases. Increased superoxide can be detected by EPR (electron paramagnetic resonance) in chloroplasts from droughted plants. Superoxide formation leads to changes suggestive of oxidative damage including lipid peroxidation and a decrease in ascorbate. These changes are not, however, apparent until severe water deficits develop, and they could also be

interpreted as secondary effects of water deficit-induced senescence or wounding. Non-lethal water deficits often result in increased activity of **superoxide dismutase,** glutathione reductase and monodehydroascorbate reductase. Increased capacity of these protective enzymes may be part of a general antioxidative response in plants involving regulation of protein synthesis or **gene** expression. Since the capacity of these enzymes is also increased by other treatments which cause oxidative damage, and which alter the balance between excitation energy input and carbon dioxide fixation such as low temperature and high irradiance, it is suggested that water deficit has the same effect. Light levels that are not normally excessive do become excessive and photoprotective/antioxidative systems are activated. Some of the photoprotective mechanisms themselves could result in active oxygen formation. Photoinhibitory damage also includes a component of oxidative damage. During normally-encountered degrees of water deficit the capacity of the antioxidant systems and their ability to respond to increased active oxygen generation may be sufficient to prevent overt expression of damage.

Desiccation-tolerant tissues such as bryophytes, lichens, spores, seeds, some algae and a few vascular plant leaves can survive desiccation to below 30-40% RWC. A component of desiccation damage in seeds and bacteria is oxygen-dependent. Desiccation causes oxidation of glutathione, a major antioxidant, and appearance of a free radical signal detected by EPR in a number of tissues suggesting that oxidative damage has occurred. In photosynthetic cells damage may arise from photo-oxidation. Disruption of membrane-bound electron tranport systems in partially hydrated tissue could lead to reduction of oxygen to superoxide. Oxidation of lipids and sulphydryl groups may also occur in dry tissue. Tolerant cells recover upon rehydration and are able to reduce their glutathione pool. Non-tolerant species go on to show further oxidative damage including lipid peroxidation. It is difficult to attribute this subsequent damage to the cause or effect of death. Embryos in seeds lose desiccation tolerance soon after imbibition. This is associated with membrane damage that has been attributed to superoxide-mediated deesterification of phospholipids and loss of lipophilic antioxidants. These effects are discussed in relation to other mechanisms involved in desiccation tolerance.

L36 ANSWER 40 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN DUPLICATE 12
ACCESSION NUMBER: 92:147848 SCISEARCH
THE GENUINE ARTICLE: HG411
TITLE: OXIDANTS AND ANTIOXIDANTS IN DEVELOPMENT AND DIFFERENTIATION
AUTHOR: ALLEN R G (Reprint); VENKATRAJ V S
CORPORATE SOURCE: ROCKEFELLER UNIV, INVEST DERMATOL LAB, 1230 YORK AVE, NEW YORK, NY, 10021 (Reprint)
COUNTRY OF AUTHOR: USA
SOURCE: JOURNAL OF NUTRITION, (MAR 1992) Vol. 122, No. 3, Supp. S, pp. 631-635.
ISSN: 0022-3166.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: ENGLISH
REFERENCE COUNT: 35
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Metabolic gradients are known to influence cellular differentiation at critical junctures of development. The existence of these gradients will stimulate variations in the rate of generation of active oxygen metabolites by metabolic pathways. Recent evidence suggests that cellular oxidation can induce changes in **gene** expression during normal development. Conversely, antioxidants such as ascorbate, alpha-tocopherol and beta-**carotene** are inhibitory to differentiation in many types of cells. One basis of oxidative influence on **gene** expression stems from changes in cellular calcium distribution.

L36 ANSWER 41 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1992:507349 CAPLUS
DOCUMENT NUMBER: 117:107349
TITLE: Mechanisms of citral phototoxicity
AUTHOR(S): Asthana, Archana; Larson, Richard A.; Marley, Karen A.; Tuveson, R. W.
CORPORATE SOURCE: Dep. Plant Biol., Univ. Illinois, Urbana, IL, 61801,

USA
SOURCE: Photochemistry and Photobiology (1992), 56(2), 211-22
CODEN: PHCBAP; ISSN: 0031-8655
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Citral, a monoterpene aldehyde synthesized by several plant genera, has been reported to exhibit antimicrobial activity. For the 1st time, it is reported that citral exhibits UV-A (315-400 nm) light enhanced oxygen-dependent toxicity against a series of Escherichia coli strains differing in DNA repair and **catalase** proficiency. Those E. coli strains carrying a **gene** leading to **catalase** deficiency (katF) are particularly sensitized to inactivation by citral and UV-A treatment when compared to **catalase** proficient strains (katF+). Consistent with these in vivo observations, citral when treated with UV-A in vitro produces H2O2. When tested against Fusarium oxysporum and F. solani, fungal root pathogens of Citrus, enhanced toxicity by citral in the presence of UV-A was demonstrated, while dark toxicity was negligible. When the plasmid pBR322 was treated with citral in the presence of UV-A, a change in conformation from the covalently closed circular to the open circular and, ultimately, the linear form was obsd. The change in plasmid conformation corresponded to a redn. in transforming activity. Holding plasmid DNA which had been treated with UV-A light in the presence of citral at 4.degree. for 22 h in the dark resulted in continued degrdn. of the DNA and loss of transforming activity. Holding plasmid DNA treated with UV-A or citral alone under identical conditions had no detectable effect on either plasmid conformation or transforming activity.

L36 ANSWER 42 OF 49 MEDLINE on STN DUPLICATE 13
ACCESSION NUMBER: 91200632 MEDLINE
DOCUMENT NUMBER: PubMed ID: 2016055
TITLE: Photoregulation of the Cat2 and Cat3 **catalase** **genes** in pigmented and pigment-deficient maize: the circadian regulation of Cat3 is superimposed on its quasi-constitutive expression in maize leaves.
AUTHOR: Acevedo A; Williamson J D; Scandalios J G
CORPORATE SOURCE: Department of Genetics, North Carolina State University, Raleigh 27695-7614.
SOURCE: Genetics, (1991 Mar) 127 (3) 601-7.
Journal code: 0374636. ISSN: 0016-6731.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199105
ENTRY DATE: Entered STN: 19910607
Last Updated on STN: 19910607
Entered Medline: 19910523

AB We have investigated the accumulation of Cat2 and Cat3 **catalase** transcripts in 6-7-day postimbibition leaves of normally pigmented and pigment-deficient maize seedlings under different light regimes. In seedlings of normal inbred maize lines Cat2 mRNA accumulates to significantly higher levels in either continuous light or a diurnal light/dark cycle than in continuous dark. In contrast to the high levels of the Cat2 message observed in their wild-type siblings, **carotenoid**-deficient mutants accumulate Cat2 mRNA at barely detectable levels. Mutants deficient in chlorophylls, but having normal **carotenoid** levels, accumulate normal levels of Cat2 mRNA. This suggests that both light and **carotenoids** are required for the normal accumulation of the Cat2 message. The steady-state level of Cat3 RNA exhibits a dramatic diurnal variation when seedlings are grown under a 24-hr light/dark cycle. We have previously shown that this variation is at the level of Cat3 **gene** transcription and is under the control of a novel circadian rhythm. In this study we show that both pigment-deficient mutants and their wild-type siblings exhibit the normal diurnal pattern of Cat3 RNA accumulation. This indicates that photosynthetic pigments, allelic variation, and genetic background do not directly affect the temporal pattern of Cat3 accumulation in leaves. We observed, however, that when normal plants are grown in either continuous light or continuous dark, the Cat3 transcript in leaves is present at uniformly high levels throughout the 24-hr sampling period.(ABSTRACT TRUNCATED AT 250 WORDS)

L36 ANSWER 43 OF 49 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 91:129197 SCISEARCH
THE GENUINE ARTICLE: EZ708
TITLE: PHOTOREGULATION OF THE CAT2 AND CAT3 **CATALASE GENES** IN PIGMENTED AND PIGMENT-DEFICIENT MAIZE - THE CIRCADIAN REGULATION OF CAT3 IS SUPERIMPOSED ON ITS QUASI-CONSTITUTIVE EXPRESSION IN MAIZE LEAVES
AUTHOR: ACEVEDO A; WILLIAMSON J D; SCANDALIOS J G (Reprint)
CORPORATE SOURCE: N CAROLINA STATE UNIV, DEPT GENET, RALEIGH, NC, 27695
COUNTRY OF AUTHOR: USA
SOURCE: GENETICS, (1991) Vol. 127, No. 3, pp. 601-607.
DOCUMENT TYPE: Article; Journal
FILE SEGMENT: LIFE; AGRI
LANGUAGE: ENGLISH
REFERENCE COUNT: 23

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB We have investigated the accumulation of Cat2 and Cat3 **catalase** transcripts in 6-7-day postimbibition leaves of normally pigmented and pigment-deficient maize seedlings under different light regimes. In seedlings of normal inbred maize lines Cat2 mRNA accumulates to significantly higher levels in either continuous light or a diurnal light/dark cycle than in continuous dark. In contrast to the high levels of the Cat2 message observed in their wild-type siblings, **carotenoid**-deficient mutants accumulate Cat2 mRNA at barely detectable levels. Mutants deficient in chlorophylls, but having normal **carotenoid** levels, accumulate normal levels of Cat2 mRNA. This suggests that both light and **carotenoids** are required for the normal accumulation of the Cat2 message. The steady-state level of Cat3 RNA exhibits a dramatic diurnal variation when seedlings are grown under a 24-hr light/dark cycle. We have previously shown that this variation is at the level of Cat3 **gene** transcription and is under the control of a novel circadian rhythm. In this study we show that both pigment-deficient mutants and their wild-type siblings exhibit the normal diurnal pattern of Cat3 RNA accumulation. This indicates that photosynthetic pigments, allelic variation, and genetic background do not directly affect the temporal pattern of Cat3 accumulation in leaves. We observed, however, that when normal plants are grown in either continuous light or continuous dark, the Cat3 transcript in leaves is present at uniformly high levels throughout the 24-hr sampling period. Because the Cat3 **gene** is continually transcribed in leaves in the absence of a cyclic light regime, the normally observed diurnal variation of Cat3 **gene** expression is apparently the result of a circadian-regulated transcriptional repressor.

L36 ANSWER 44 OF 49 MEDLINE on STN DUPLICATE 14
ACCESSION NUMBER: 91090042 MEDLINE
DOCUMENT NUMBER: PubMed ID: 1985414
TITLE: Antioxidants and aging.
AUTHOR: Cutler R G
CORPORATE SOURCE: Gerontology Research Center, National Institute on Aging, Baltimore, MD 21224.
SOURCE: American journal of clinical nutrition, (1991 Jan) 53 (1 Suppl) 373S-379S. Ref: 27
Journal code: 0376027. ISSN: 0002-9165.
PUB. COUNTRY: United States
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LANGUAGE: English
FILE SEGMENT: Abridged Index Medicus Journals; Priority Journals; Space Life Sciences
ENTRY MONTH: 199102
ENTRY DATE: Entered STN: 19910322
Last Updated on STN: 19910322
Entered Medline: 19910201

AB Aging in mammalian species appears to be the result of normal developmental and metabolic processes. In spite of the vast complexity of aging processes, relatively less complex processes such as longevity determinant **genes** (LDGs) may exist governing aging rate. Much experimental data exists indicating a causative role of oxyradicals in

aging processes. In testing the hypothesis that antioxidants may represent LDGs, a positive correlation in the tissue concentration of specific antioxidants with life span of mammals was found. These antioxidants include **superoxide dismutase, carotenoids,** alpha-tocopherol, and uric acid. We also found that the resistance of tissues to spontaneous autoxidation and the amount of oxidative damage to DNA correlates inversely with life span of mammals. These results suggest a role of oxyradicals in causing aging and that the antioxidant status of an individual could be important in determining frequency of age-dependent diseases and duration of general health maintenance.

L36 ANSWER 45 OF 49 MEDLINE on STN DUPLICATE 15
ACCESSION NUMBER: 91142256 MEDLINE
DOCUMENT NUMBER: PubMed ID: 1962859
TITLE: Light-dependent cytotoxic reactions of anthracene.
AUTHOR: Tuveson R W; Wang G R; Wang T P; Kagan J
CORPORATE SOURCE: Department of Microbiology, University of Illinois, Urbana-Champaign 61801.
CONTRACT NUMBER: ES04397 (NIEHS)
SOURCE: Photochemistry and photobiology, (1990 Nov) 52 (5) 993-1002.
Journal code: 0376425. ISSN: 0031-8655.
PUB. COUNTRY: ENGLAND: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199103
ENTRY DATE: Entered STN: 19910412
Last Updated on STN: 19910412
Entered Medline: 19910325

AB Anthracene is a photodynamic compound in vitro. In the presence of oxygen, it is known to generate singlet oxygen and participate in Type II reactions. In aqueous solution, it also participates in Type I reactions, such as in the photoreduction of cytochrome c, which can be suppressed by **superoxide dismutase**. In argon, direct photoreduction of cytochrome c also takes place. Anthracene induces the photodynamic hemolysis of human erythrocytes and inactivates Escherichia coli cells photodynamically. By using a series of E. coli strains differing in DNA repair capabilities and **catalase** proficiency, sensitivity to inactivation by anthracene plus NUV was correlated with **catalase** deficiency rather than with particular repair deficiencies. The fact that **carotenoid genes** cloned and expressed in E. coli offered partial protection suggests that the membrane may be one possible target for inactivation by anthracene plus NUV. Anthracene plus NUV inactivated Haemophilus influenzae transforming DNA and led to nicking of supercoiled pBR322 DNA in vitro. In vivo, therefore, anthracene is a phototoxic molecule whose cytotoxicity could be the result of damage to more than one target.

L36 ANSWER 46 OF 49 MEDLINE on STN
ACCESSION NUMBER: 91126198 MEDLINE
DOCUMENT NUMBER: PubMed ID: 2281132
TITLE: Radical reactions in vivo--an overview.
AUTHOR: Saran M; Bors W
CORPORATE SOURCE: GSF-Institut fur Strahlenbiologie, Neuherberg, Federal Republic of Germany.
SOURCE: Radiation and environmental biophysics, (1990) 29 (4) 249-62. Ref: 66
Journal code: 0415677. ISSN: 0301-634X.
PUB. COUNTRY: GERMANY: Germany, Federal Republic of
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
General Review; (REVIEW)
(REVIEW, TUTORIAL)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 199103
ENTRY DATE: Entered STN: 19910405
Last Updated on STN: 19910405
Entered Medline: 19910308

AB Generation of radicals in vivo depends on metabolic activities. The

reactions are usually influenced by (i) the presence and concentration of oxygen; (ii) the availability of transition metals (effects of binding and compartimentalization); (iii) the level of reductants and antioxidants (e.g. nutritional effects). The effects of radicals are thought to be due to (i) membrane damage (affecting passive or active transport through altered fluidity/function interrelationships, intercellular messenging through modifications in the synthesis of prostaglandins and leukotrienes); (ii) protein damage (e.g. affecting membrane transporters, channel proteins, receptor or regulatory proteins, immunomodulators); (iii) damage to DNA. Defense mechanisms consist of (i) prevention of the 'spreading' of primary damage by low molecular weight antioxidants (e.g. vitamin E, GSH, vitamin C, beta-**carotene**, uric acid); (ii) prevention or limitation of 'secondary' damage by enzymes (e.g. GSH-peroxidase, **catalase**, **superoxide dismutase**, DT-diaphorase) and/or chelators; (iii) repair processes, e.g. lipid degradation/membrane repair enzymes (phospholipases, peroxidases, some transferases and reductases), protein disposal or repair enzymes (proteases, GSSG-reductase), DNA degradation repair enzymes (exonuclease III, endonucleases III and IV, glycosylases, polymerases). Recent hypotheses on a messenging function of the superoxide anion O2- are discussed and possible implications of cross-reactions between O2- and nitric oxide (endothelium-derived relaxing factor EDRF) are shortly mentioned.

L36 ANSWER 47 OF 49 EMBASE COPYRIGHT 2004 ELSEVIER INC. ALL RIGHTS RESERVED. on STN

ACCESSION NUMBER: 89281631 EMBASE
DOCUMENT NUMBER: 1989281631
TITLE: On the etiopathogenesis and therapy of Down syndrome.
AUTHOR: Antila E.; Westermarck T.
CORPORATE SOURCE: Department of Anatomy, University of Helsinki, Siltavaorenpenger 20A, Helsinki, Finland
SOURCE: International Journal of Developmental Biology, (1989) 33/1 (183-188).
ISSN: 0214-6282 CODEN: IJDBE5
COUNTRY: Spain
DOCUMENT TYPE: Journal; Article
FILE SEGMENT: 007 Pediatrics and Pediatric Surgery
021 Developmental Biology and Teratology
022 Human Genetics
037 Drug Literature Index
LANGUAGE: English
SUMMARY LANGUAGE: English

AB The etiopathogenesis of Down syndrome is reviewed concentrating on the possible consequences of over-expression of cytoplasmic **superoxide dismutase gene** located in chromosome 21. Increased **superoxide dismutase** activity may generate free radical stress through overproduction of hydrogen peroxide. The significance of inadequate adaptive responses, i.e. increase of the selenoenzyme glutathione peroxidase activity in the central nervous system and in the thyroid gland is discussed. Suggestions are made for prevention of the progress of Down syndrome and intervention studies with antioxidant supplementation are proposed.

L36 ANSWER 48 OF 49 MEDLINE on STN

ACCESSION NUMBER: 83244822 MEDLINE
DOCUMENT NUMBER: PubMed ID: 6866004
TITLE: Phagocytosis-induced mutagenesis in bacteria.
AUTHOR: Barak M; Ulitzur S; Merzbach D
SOURCE: Mutation research, (1983 Jul) 121 (1) 7-16.
Journal code: 0400763. ISSN: 0027-5107.
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 198308
ENTRY DATE: Entered STN: 19900319
Last Updated on STN: 19900319
Entered Medline: 19830826

AB Dark mutants of the luminous bacteria Photobacterium fischeri reverted to hereditary stable luminescent forms when incubated with human

polymorphonuclear neutrophils (PMN). The maximal mutagenic effect occurred during the first 15 min of phagocytosis, and was dependent on the phagocyte:bacterium ratio as well as on the integrity of the PMN cells. Heat-killed phagocytes or disintegrated phagocytes did not show any mutagenic activity, whereas the supernatant of the phagocytosis reaction exerted mutagenic activity. Scavengers of hydroxyl radical such as mannitol or benzoate and scavengers of singlet oxygen such as beta-**carotene**, as well as the presence of **superoxide dismutase**, prevented the mutations. The role of reactive oxygen metabolites in the phagocyte-mediated mutagenic process is discussed.

L36 ANSWER 49 OF 49 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1941:22742 CAPLUS
DOCUMENT NUMBER: 35:22742
ORIGINAL REFERENCE NO.: 35:3596a-h
TITLE: Invert soaps. I. Action of invert soaps on proteins
AUTHOR(S): Kuhn, Richard; Bielig, Hans-Joachim; Dann, O.
SOURCE: Ber. (1940), 73B, 1080-91
DOCUMENT TYPE: Journal
LANGUAGE: Unavailable

AB K. and B. intended to study the mechanism of the bactericidal action of Zephirol (mixt. of alkyldimethylbenzylammonium chlorides) and other quaternary ammonium, sulfonium and phosphonium salts by means of expts. on the interaction of these "invert soaps" (usually dodecyldimethylbenzylammonium bromide) with proteins, chromoproteids, ferments, symplexes and **genes**. Symplexes such as the echinochrome symplex from Arbacia pustulosa are split by invert soaps; the liberation of the dye component is independent of the pptn. of the protein component. Chlorophyll and **carotenoids** are liberated from chloroplastin solns. by invert soaps but not by true soaps or aliphatic alc. sulfonates, and can then be extd. with ether or benzene. With decreasing concn. the degree of dye liberation decreases rapidly at first, then slowly; the point of inflection corresponds to the max. of the concn.-drop no. curve (surface tension), but no direct relation exists between surface tension and liberating action. About 30 mols. dodecyldimethylsulfonium iodide per mol. chlorophyll are necessary to liberate 1/6 of the latter. The prosthetic groups of chromoproteids (yellow ferment, oxyhemoglobin, **catalase**, ferritin, oxyhemocyanin) are usually not liberated; even 2% invert soap has no effect on the H2O2 decompn. activity of **catalase**; ovoverdine is the only exception found. Proteins are pptd. in the form of anions and only in a given Ph range; all except salmine are pptd. in soda solns., none in dil. H2SO4; at pH 5-6 pepsin, casein, gelatin, egg albumin, serum albumin, urease and oxyhemocyanin are pptd.; yellow ferment, trypsin, insulin, **catalase**, pseudoglobulin, oxyhemoglobin, globin and salmine are not pptd.; the ppts. redissolve at higher concns.; SH groups are liberated at very low concns. The concns. required for pptn. are of the same order as required to kill bacteria. The **gene**, MD, of Chlamydomonas is transformed by dodecyldimethylbenzylammonium bromide or 1-dodecyl-3-ethylbenzotriazolium bromide to mutants which (1) do not excrete androtermone, (2) contain no picrocrocin ferment, or (3) less chlorophyll, as in the case of x-rays. The F and M **genes** (cis-trans gamone determinants) are mutated by x-rays but not by invert soaps. .beta.-**Carotene** is obtained from carrots by shaking 5 kg. of the finely ground material with 5 l. of a 1.5-2.0% Zephirol soln. for 5 hrs., centrifuging (3000 r. p. m.), filtering off the red crystals, extg. the aq. soln. with petr. ether for a 2nd fraction, extg. the solid residue with petr. ether for a 3rd fraction and working up by standard methods; total yield, 250 mg. pure .beta.-**carotene**, 100-150 mg. crude cryst. .alpha.- and .gamma.-**carotenes**. Lycopene was similarly obtained from tomatoes; yield, 110-130 mg. from 3 kg. fresh material. Provitamin A in carrot juice was detd. by shaking 5 cc. with 5 cc. of a 5% Zephirol soln., centrifuging, extg. separately the supernatant soln. and the solid residue with benzene, removing xanthophyll with 90% MeOH, and xanthophyll esters with 5% KOH-MeOH, evapg. under N and detg. the **carotene** content of the residue colorimetrically in heptane or benzene soln. The results agree to .+-.4% with those obtained by the MeOH dehydration method.

=> log y